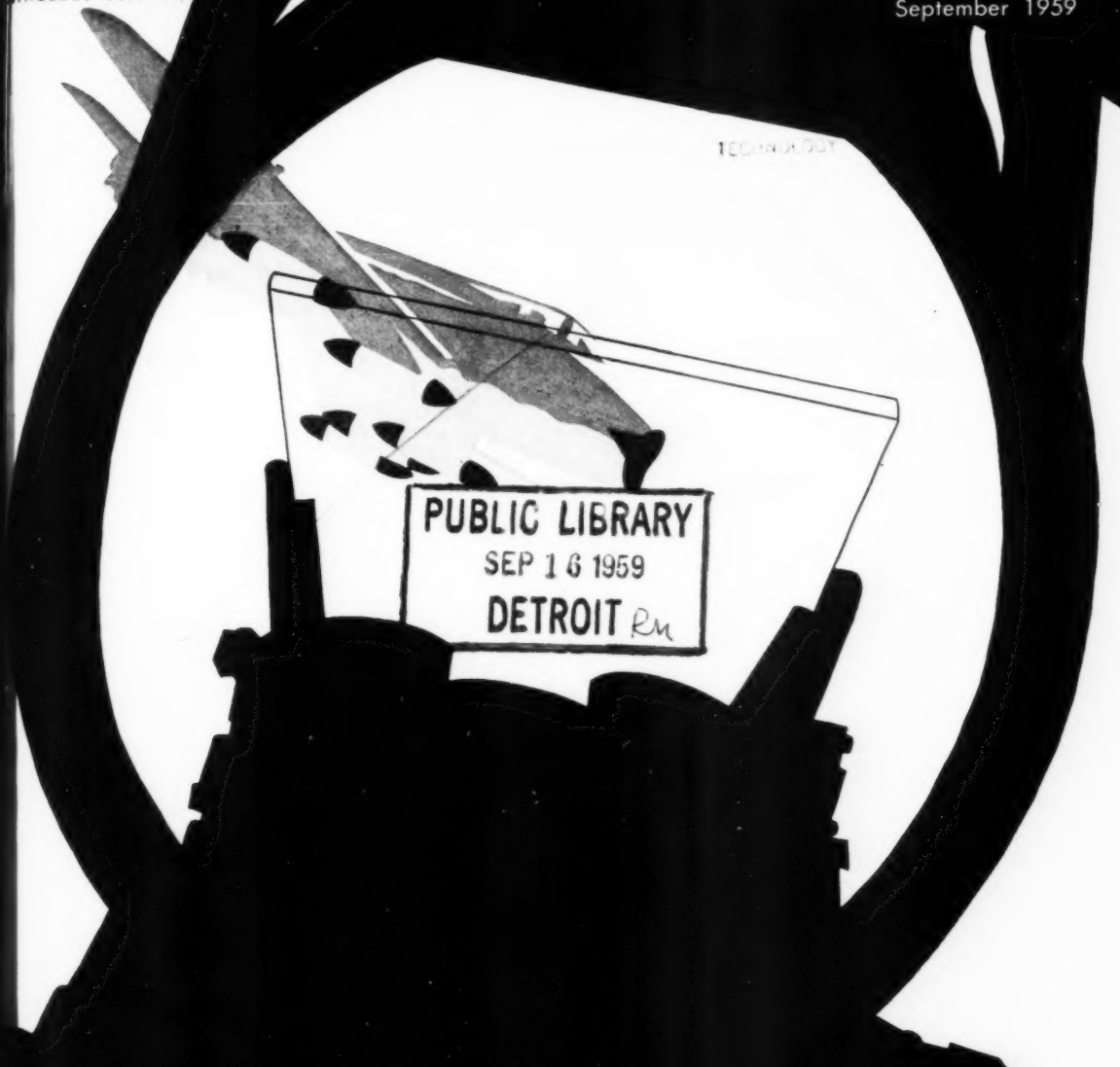
September 1959



approach

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approach

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ONE MIDAIR, COMING UP!

Artist Max Katz depicts a chilling sight on this month's cover to emphasize the safety theme for September—midair collisions.

With dividers, slide rule, flight manual and some basic physics you might conclude that this scene would never result in a collision, that you'd miss his tail by at least a fathom or two.

But every collision starts out by being a near-collision. And every near-collision starts out by two aircraft, far apart, getting closer together than they should—for a reason. It may be carelessness, inattention, or diversion of attention. It may be reduced visibility or an inappropriate clearance. Or it may be a rapid head-on closing rate which taxes the human ability to sense, interpret and react in the few available seconds. Or a combination of any of those things.

Whatever the cause, airplanes don't fly themselves into collisions—not unless they're allowed to by people. Strict adherence to course rules and VFR semicircular cruise altitudes, monitoring of enroute frequencies, and, most important—constant alert watchfulness, are the pilot's tools for avoiding the near-collisions which have a deadly way of becoming collisions.

Purposes and Policies: APPROACH is published monthly and contains the most accurate information currently available on the subject of aviation accident prevention. Contents should not be construed as regulations, orders, or directives. Material extracted from Aircraft Accident Reports (OpNavs 3750-1 and 3750-10), Medical Officer's Reports (OpNav 3750-8) and Anymouse (anonymous) Reports may not be construed as incriminating under Art. 31, UCMJ. Photos: Official Navy or as credited.
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LETTERS

Lighting Speed Traps

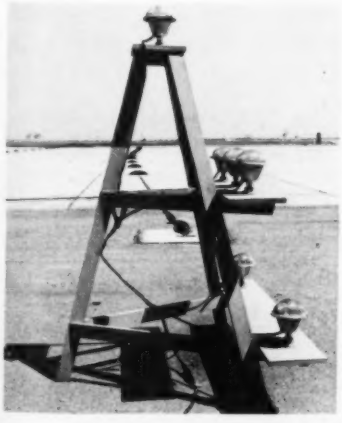
Sir:

In your article "Speed Trap," you mentioned the need for proper lighting of emergency arresting gear.

NAS Miramar has been working on this problem over the past two years. Several types of markers have been evaluated. The following are the results:

1. Colored Runway Lights
   A. Due to the high speed of jets and the low placement of light it is difficult for the pilot to spot these lights and to pinpoint the arresting gear.
2. Flood Lights
   A. Same as above
   B. Interferes with pilots' night vision
3. Blinker Lights
   A. Confusing to pilots
4. Smudge Pots
   A. Very effective on A-frame
   B. Considered too dangerous to aircraft (i.e. fire hazard)

5. The electrical A-frame now in use at Miramar can be seen during the approach from the 45-degree position on through roll out at night. The use of yellow lens makes it identifiable at all times giving the pilot a positive position of the arresting gear. The A-frame also "positions" the pilot on normal roll out, assisting the runway distance marker in easing the pilot's problem of planning his braking.



6. The electrical A-frame could be made a permanent part of airfield lighting. This could be done by adding one transformer (Pole Base Type-GE series/multiple, 6.6 amp 200 watt) in the nearest runway transformer hole and by replacing the lighting fixtures we now use with M1 Type fixtures lights (FSN 621E-284-1462-D336 with yellow shade). The A-frame could be secured on small concrete pads similar to those used for runway distance markers. See photos and sketches attached.

J. P. HOLMES,
ABCS, USN

• Chief Holmes has supplied us with a schematic drawing of this installation. Copies of same may be obtained by writing APPROACH.

Wet Dry Run

Sir:

We thought you'd be interested in an exercise conducted by our squadron just 3 days prior to the appearance in our readyroom of your April 1959 "Wet Dry Run" APPROACH. During the course of a bailout the pilot's problem at the moment of contact with the water is multiplied many times by addition of the wind factor (trade winds in our area average 12-17 knots the year round).

Utilizing the overhead 10-ton crane at our station boat house, we rigged a parachute sling to the crane with a quick-disconnect attachment so that a sharp pull on a lanyard would cause the chute to be dropped into the water. Also attached to the sling was a 50-foot length of half-inch line, the other end of which was tied to our CO's 12-foot 35 horsepower runabout. The crane with pilot hanging in sling was swung out over

the water and about 8-10 feet above the water level. The pilot was then given time to sit back in the harness (if he could) undo his leg and shoulder straps and free his life raft from the seat pack. During this time any slack on the line between sling and boat was taken up. With the boat in gear and on a signal (not from the pilot) the sling dropped free of the crane while at the same time the throttle was added in the boat. The 8-10 foot free-fall from crane to water approximated speed of entry in an actual situation and the boat moving at 5-6 knots simulated (and rather realistically I might add) the wind effect on the chute canopy as the pilot hits the water in an actual situation.

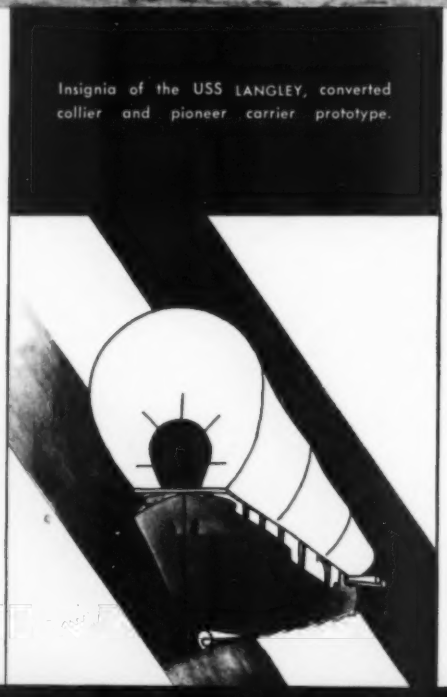
It is interesting to note that 4 out of 27 pilots failed to get free of the harness and 14 experienced extreme difficulty in sitting back in the harness while hanging in the air.

The exercise was quite beneficial in that just one week ago a pilot in our squadron ejected at 7000 feet at night over water (wind on water was 10-15 knots). Having undergone our version of the Wet Dry Run, he was better able to meet the problems which faced him. As a matter of fact he stated that the actual separation from the harness was easier than the drill.

C. L. ZANGAS
Flight Safety Officer
VMA-214

APPROACH welcomes letters from its readers. Letters should be signed though names will be withheld on request. Address: APPROACH, Naval Aviation Safety Center, NAS Norfolk 11, Va. Views expressed are those of the writers and do not imply endorsement by the U.S. Naval Aviation Safety Center.

'...only the BuNo has changed...'



Insignia of the USS LANGLEY, converted collier and pioneer carrier prototype.

UNITED STATES FLEET

AIRCRAFT SQUADRONS, BATTLE FLEET

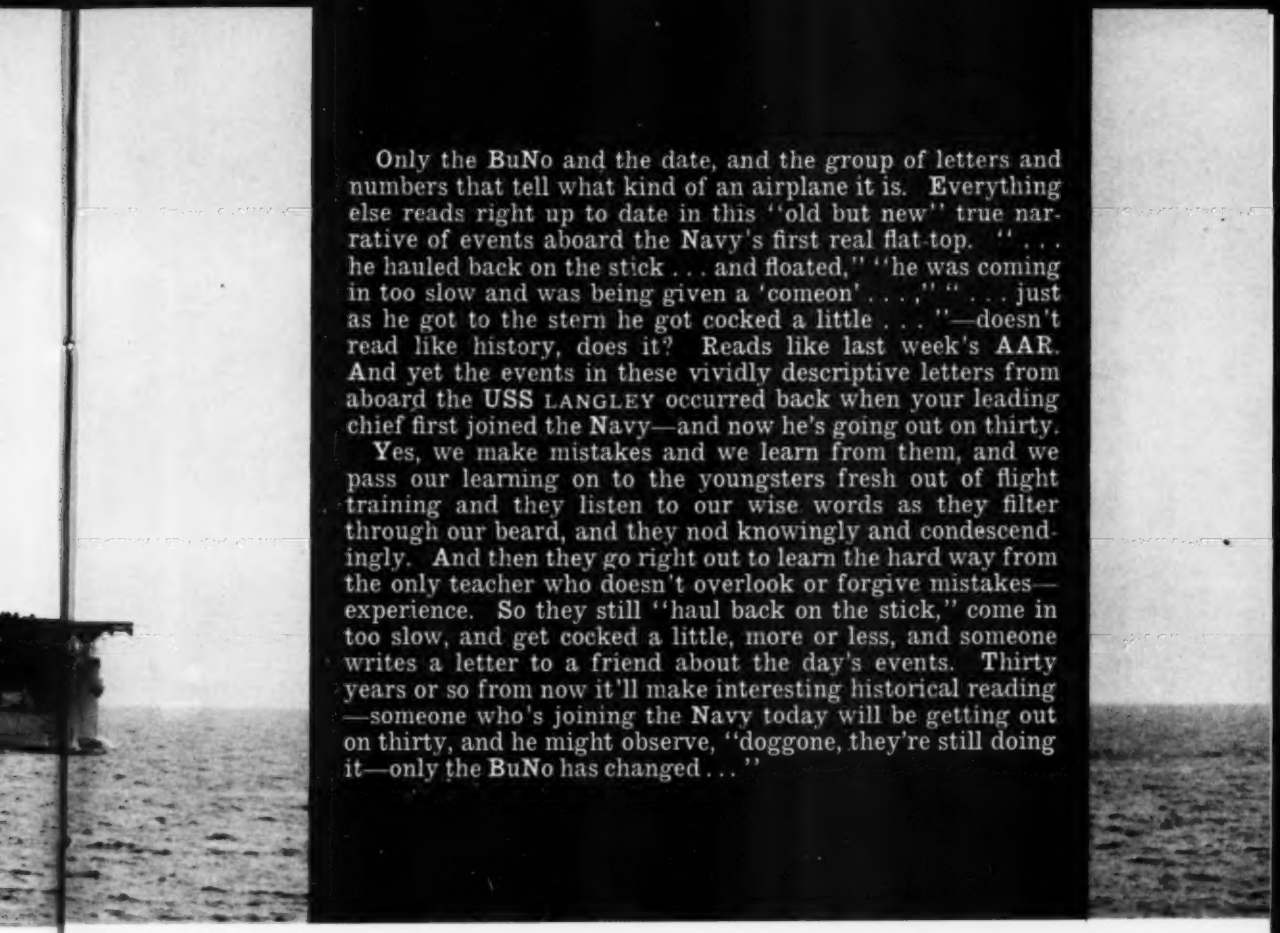
U.S.S. LANGLEY

9 August 1929

Dear S----------,

We have had four major casualties in 738 landings since we first took off the fore and aft wires. The first egg was laid by a Chief A.P. in one of our FUs. He hauled back on the stick when he got the "cut gun" and floated over the entire gear, finally crashing into the barrier. The principal damage was done by the prop cutting the top barrier wire so that a taut whip end of it came back & broke the spars of the right tip & lower wings, broke the left V-strut, broke two engine cylinders & ripped the fuselage. Also he blew his right tire & broke the tail skag. Fore and aft wires could never have saved him.

The second egg was laid by Ens. J. in an O2U2. He came over the stern OK. Then he started to haul back & float. He floated to the starboard



Only the BuNo and the date, and the group of letters and numbers that tell what kind of an airplane it is. Everything else reads right up to date in this "old but new" true narrative of events aboard the Navy's first real flat-top. " . . . he hauled back on the stick . . . and floated," "he was coming in too slow and was being given a 'comeon' . . . ," " . . . just as he got to the stern he got cocked a little . . . "—doesn't read like history, does it? Reads like last week's AAR. And yet the events in these vividly descriptive letters from aboard the USS LANGLEY occurred back when your leading chief first joined the Navy—and now he's going out on thirty.

Yes, we make mistakes and we learn from them, and we pass our learning on to the youngsters fresh out of flight training and they listen to our wise words as they filter through our beard, and they nod knowingly and condescendingly. And then they go right out to learn the hard way from the only teacher who doesn't overlook or forgive mistakes—experience. So they still "haul back on the stick," come in too slow, and get cocked a little, more or less, and someone writes a letter to a friend about the day's events. Thirty years or so from now it'll make interesting historical reading—someone who's joining the Navy today will be getting out on thirty, and he might observe, "doggone, they're still doing it—only the BuNo has changed . . . "

side of the deck and landed somewhere between #3 & #4 wire, almost at the outboard limit of the gear. Even then he would have been OK except for a peculiar accident which, it was discovered later, must have happened as he passed over #4 wire. The aluminum fairing piece which the O2Us carry underneath the fuselage right at the tail skid, and on which the leather tail skid boot is mounted, had apparently come loose at the forward edge. It was caught by some obstruction & pulled back slightly and simultaneously the hook bounced up against the fuselage. As this happened the plate snapped forward & caught the hook against the fuselage, preventing it from engaging #4 or #5 wire. The plane therefore rolled into the barrier, binding the prop, crashing the landing gear, and ripping the fabric in various places.

All squadrons with O2Us out here have been warned to secure these plates by means of clips and bolts to the tubular members of the fuselage directly above the plate instead of by means of the wood screws now used at the forward edge to a false wooden crosspiece put there merely for securing purposes. The accident probably won't happen again in a hundred years because of all the peculiar accidents which had to take place almost simultaneously for this to occur.

The third crash which hardly damaged the plane at all was the T4M flown by Ens. S. He came aboard with his tail hook not released, first because he forgot it and second because no one on deck saw it. He ran normally down the centerline and into the barrier. Little damage was done to the plane because the top barrier wire hit the extremely heavy oleo cylinders of the landing gear merely tearing the light streamline plate. The lower wire of the barrier apparently was rolled over by the large wheels just as they roll over crosswires. Except for a damaged lower right aileron which couldn't clear the starboard barrier standard he could have continued flying. The report that he ran almost to the bow is in error as he stopped about 110 feet from it, at least. It just seemed far to observers back aft. Also no unusual damage was done to the barrier. If

his right wing could have cleared the starboard standard we would have had only one broken wire. As it was, this standard was bent forward, tearing the gusset plate at the deck and cracking the diagonal angle. It was easily replaced, the old one was straightened & welded and is now actually back in place again. To avoid recurrence of this we have had large cards printed with HOOK on them with a string attached which we hand to any pilot who is slow about lowering his hook & tell him to hang it around his neck. It is large enough so that it is inconvenient & he is constantly reminded. Also we have placed an extra man behind Billings with a pair of flags to give the OK when the hook is lowered or to notify Bill in case it isn't. This man has no other duties.

The latest crash, also a T4M, was flown by an AP just out of Pensacola. He was coming in too slow & was consistently being given a "come-on" by Bill. At the last come-on he went haywire and completely cut his gun, just barely connecting with the deck. The mark of his tail skid was left on the ramp. He landed about 10 feet inboard from the port edge of the deck, plane heading for the stacks. His hook mark on the deck shows that it passed about a foot outboard of the sheave of #1 wire so that it couldn't engage anything. He continued his course, passed over the stacks & port operating platform with right wheel still on the deck. Just after passing the stacks, his right wheel rolled off the deck and he went into the net with his landing gear. This obstruction caused him to make a half outside loop so that he landed on his back in the water, nose toward the ship. After what seemed 5 minutes he came up from underneath & found a ring buoy which had been tossed there for him and almost immediately thereafter the plane sank. He was picked up by the Aroostook unhurt. The next day he came out again in a T4M, made fine landings & was qualified. What can be done to avoid stage fright & failure to follow signals on first landing, I don't know, especially when a man shows up excellent in field training and gives no cause for suspicion.

As you can see, not a single one of these crashes would have been averted by fore and aft wires. On the other hand several of the successful landings which have been made would have been certain crashes with the old gear because of the jazzy way in which some of them have landed.

Of minor crashes we have had 29. Thirteen of these have been merely broken tail skid or tail skid shoe casting. Seven have been blown tire or broken wheel. Five have been breakage of a landing gear strut, some involving bending or pulling out spreader tube, 1 caught aileron horn in wire, 1 tore wing fabric

A DT-1 (Douglas Torpedo), brother-in-law of the famous round- the-world cruisers, snags the early fore-and-aft wires of the LANGLEY.

on a pie, 1 bent axle on a pie, 1 pulled spreader out after a bounce. Worst of these have happened in FUs, with weak landing gear and tendency to bounce due to rubber shock absorber. None of these would have been avoided with fore and aft wires. Get rid of wooden tail skids and brittle tail skid shoe castings and most of the minor crashes will be avoided. There is no question in anybody's mind but that the simplified gear is a great improvement and is here to stay.

LANGLEY (CV-1) later had fore end of deck cut off, became AVS-3, was sunk with a deckload of P-40s bound for Australia in the early days of WWII.

Regarding _____'s crash all I know is what I have heard, viz that he is inexperienced in carrier landings even though an old timer and every landing of his was a potential crash. Yet he goes to work & makes landings at night right after cracking up at day.

I have just completed a thorough analysis of the characteristics of the Langley gear, which I will forward to you as soon as blue printed. I think similar studies should be made of each type of gear we now have and I was surprised to find nothing about ours in our files.

Will write you soon again about some experimental work.

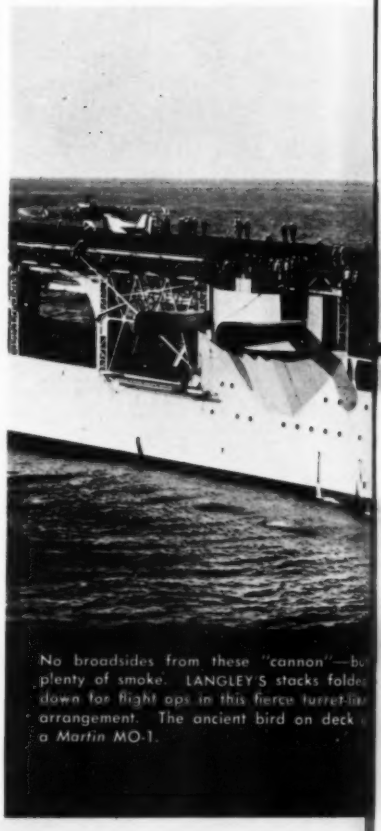
P_____

15 August 1929

Dear S_____,

When I wrote the account of crashes which you received this week I thought I would have a rest for a while before another account would be due. But this week's operation of three days has added three more—two major and one minor. The two majors happened Monday on successive landings and I suppose you got the headlines on them by dispatch. Here are the details: An AP had the first one in an F3B. He was making his 6th or 7th qualification landing in apparently normal style till he reached the stern. All preceding landings had been fine as was his work at the field. This time, however, when he got the cut gun signal he failed to do so completely. Then to make matters worse he hauled back on the stick and floated over the entire gear at about 6 feet off the deck until he had passed #5 wire. By that time his wheels had just about reached the deck and it looked like just a plain barrier crash. But he still had a surprise in store, for just before getting to the barrier (forward one) he gave her full gun and flew right through it cutting both wires without much retardation—instead he ground looped to the right and went over the side landing right side up in the water. In going through the barrier he practically cut off his nose and badly sliced his face, presumably from broken goggles, so he landed in the water bleeding like a stuck pig and looking worse. But the signals on deck were missed until it was all over when a pair of spare fingers were found lying on the port side of the deck. It appears that one of the gasmen was standing in the nets right next to port barrier standard. His story is that he pushed the man next to him out of the way when he saw the crash impending and in so doing lost his balance and grabbed something which we found later must have been one of the anchor wires where the barrier wires are secured to the deck at the waterway. As he grabbed it, the wire snapped down and yanked off his third and fourth fingers, right hand at the first joint against the waterway. On the starboard side, things were happening too, for a whip end of one of the parted barrier wires came singing back and laid open the scalp of another bystander in the starboard nets. Well, needless to say, there was much excitement. The plane in the water sank and the pilot

grabbed a ring buoy tossed to him, the Aroostook meantime sending out her life boat to pick him up. The wounded on deck were taken to sick bay and we were proceeding to fix up the barriers—that is replace the barrier wires, when the decision was made to land the three planes in the air and park them. Looking back I saw an F2B approaching in the groove, Ens. R. as pilot. Just as he got to the stern he got cocked a little and as a consequence was heading for the port side. To make matters worse he dove for the gear, and held on plenty of left rudder. This was his first landing and whether that fact plus what he had just seen take place put him all haywire or not I don't know. However, he hooked #2 wire just about 4 or 5 inches inboard of the sheave and it promptly parted because of his speed, the angle of approach, and no span on the wire. He continued then to port, left wheel over the side, right wheel crashing a little further on. Just as he passed the port brake handle, his right lower wing then being practically on deck, he picked up a man on the deck and rolled him between his wing and the deck as you would roll a cigaret with the palm of your hand on the table. The man he caught was the regular brakeman for that side, but he had been up the barrier helping to fix it when the plane started to come in. Seeing his brake unmanned he dashed down the deck to get to it and then got caught like a man between third base and home not knowing which way to turn. Meantime another man in the net had hopped on the brake handle so it was actually operated. However, plane, pilot, and man on deck all went over the side. I felt sure that the man on deck had had his body severed as the plane's wing squeezed him over the edge of the deck and never expected to see him come up to the surface. However he landed flat on his side in the water and almost instantly appeared threshing around with blood spouting from a long gash in his head. Pilot & plane landed right side up and we all yelled to the pilot to grab this man which he did and both hung on to a life buoy tossed to them. Our life boat by then was in the water and coming around to pick them up. Again a pair of spectators on deck were hurt and discovered later. One man was cut on the head by the whip end of #2 wire snapping around and another man was very lightly side swiped by it and in excitement or otherwise stepped over the side from the nets without being observed by anyone. However, as the air cleared we finally found the following conditions: two planes already sunk, one pilot just being picked up by the Aroostook's life boat, one pilot and man on the port side about to be picked up by our own life boat, and this other man not far from them. He was also picked up by our boat. The injured were brought aboard from both lifeboats and we all turned to on



No broadsides from these "cannon"—but plenty of smoke. LANGLEY'S stacks folded down for flight ops in this fierce turret-like arrangement. The ancient bird on deck is a Martin MO-1.

The O2U Vought could bite into its [illegible] boat in a hard landing—and sometimes did. O2U was also made in a "convertible" model—float and a set of wheels came with each plane, could be changed in about 45 minutes.

deck and started to put it back into condition to operate. #2 wire had to be renewed, the first barrier still was unfixed and two sections of netting and supporting stanchions on the port side had to be repaired. By 12:45, or about one hour after the second crash, we had the deck ready again & at 1:15 we held flight quarters continuing training operations with two T4Ms without further incident. All injured persons are now coming along nicely as all head wounds were severely cut without fractures of the skull. The man rolled over the side is in the worst shape with unknown internal chest damage. However, the doctors say that if pneumonia does not set in he will come out of it all O.K.

In carefully going over both of these there is nothing that I can lay my finger on and say if this were corrected they would not have happened or could be avoided in the future. And certainly the absence of fore-&-aft wires did not have one iota to do with these crashes. They would have crashed just as certainly & in the same way if they had been in place. How does it appear to you from longer range, not only from the details I have given you of these crashes but also those I gave in the last letter?

The minor crash occurred in today's operations with our squadron VS-1, out for training for the tactical exercises which start next week. K. came in for the first landing with the O2U amphibian and sat down a little hard on the deck. As a result the port axle broke and the threaded member inside the sleeve under the pontoon pulled out about 5 inches. No damage was done to the main float except a small dent on the port wing tip float was also dented a little. He might have avoided it only by carrying a little throttle after getting the cut gun signal as the amphibians drop like a stone from a slow or normal approach.

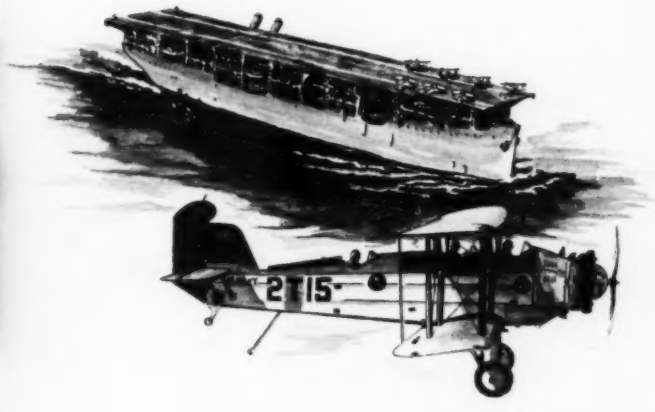
As to the queries raised in Nick's letter I don't think lowering of the hook is at all necessary, nor do I think that lowering the height of wires has anything to do with the crashes we have had. We only have two low wires, #1 and #3. The others are still kept at the same height as they are coupled wires and have no tension on them from the weight system. The reason we have not lowered them is that in normal operations some stretch is induced in them and having no tension on them we can't afford to lower them for fear they might sag to the deck from a lower pie. Having some high and some low wires and no crashes being due to the height of either kind eliminates that factor. As to maintenance of arresting gear in planes, there is no doubt but what some of our minor crashes have been due to improper condition of maintenance by the squadron. As a consequence, we have made up a new carrier plane check off list, which I am enclosing. *(See back cover.)* Copies of these have been furnished each squadron with directions to make sure that their planes comply in every detail before coming aboard, so that the planes will be in proper condition & the pilot can truthfully sign to that effect.

If you want any more dope in addition to what I have sent in this and the last letter, let me know.

Best regards,

P--------

These letters courtesy of Mr. Lee M. Pearson, BuAer scientific historian.



Martin T4M, also made by Great Lakes as the TG-1, had six-man wingfold crews. An experienced pilot could "call his wire" before touchdown—and win his bet!

How was your day?

SERIOUSLY, how was your day? Fine, you say? A good breakfast after a good night's sleep, wife in a good mood, full of bright sayings . . . Wonderful!

Big bull session in the ready-room this morning — sure got your point across about the importance of ground effect, didn't you? Imagine that kid trying to tell you that there was no advantage in flying on the deck! Good hop, too. A relatively short one compared to some of the hops you normally fly, but that navigation was right on, and the time on the way home wasn't too bad. Approach control was on the job as usual and you really made a smooth landing . . . and that first beer at the club sure tasted good! But really, how *was* your day?

Remember that character that broke down into the outgoing traffic this morning as you took off with that load on? Just missed you, didn't he? Or the *Bonanza* that you didn't see 'till the last minute that tooled across your flight path when you hopped over that saddleback just south of the station? Remember? Still wonder what that swift shadow was that passed over you as you were figuring out the ETA over Point Kilo? Momentarily startled you, didn't it, but there was nothing in sight either before or after. Imagination? Possibly. But that traffic when you finally did get back home—have you ever seen so many jets, transports, *Alpha Deltas* and *Beech's* at the same place at the same time trying to do the same thing? Guess everyone was trying to get to the club for happy hour. Hope that *Cougar* you cut out

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downwind had a couple hundred pounds aboard. Didn't want to give way, did he? But what the devil, he can get around faster than you can, and after all, you were tired. So you say you had a good day? Look at yourself real well, Buster . . . you darned near messed it up with a midair collision!

Today you may have been another statistics in a midair near-collision report or two. Sure, they pile up every day. A recent compilation of reports from airline pilots, civil pilots, and an occasional military source by the Air Transport Association indicates that 65% of near-misses occur in full daylight; 22% during darkness; 8% at dusk; 3% on bright moonlit nights; and 2% at dawn. Such figures naturally are far from complete. Looking at the figures more closely, we find that the majority, 43% occur during periods of good visibility —15 miles or more. Similarly, Navy records of actual midair collisions over a period of two years, show that the majority, 78% occurred in periods of good visibility. Just the contrary of what the average pilot would expect, isn't it? Most of us have always associated collisions and near-misses with darkness and similar poor visibility.

These are the figures—what factors account for them? A portion of the blame can be attributed to the increased flying during such periods. Even then though, one would imagine that the percentages would be kept to the minimum for the same reason—more aircraft, better visibility, everyone stays clear of everyone else.

Undoubtedly the primary contributing factors in midairs and near-misses can be attributed to the physiological aspects of aviation. None of us are going to intentionally have a midair, but just how closely can we control our actions in this jet age? You're a darned good aviator, good physical condition, 20/20 eyes, et al . . . wonderful, but that isn't enough. Leave us look at some pertinent facts that sometimes become uncontrollable.

Midairs are caused either by pilots not seeing the other aircraft involved, seeing it too late to avoid collision, or failing to take the necessary action after seeing it.

The first of the above factors is understandable. Visibility from the cockpits of some of our present day transports and jets is less than ideal, making it difficult for pilots to spot every other aircraft within range. Pilots personal equipment, i.e., helmets, visors, and oxygen masks further restrict visibility. The blind area on each eye's opposite side (nose interference) as well as the optic nerve blind spot are present, but not of too much consequence since the use of both eyes (most of us do fly with our eyes open, regardless of what some flight instructors say!) tends to cancel out such blank areas. (*Note item on page 24.*) Relative sizes of objects, in this case aircraft, enter into the failure of pilots to see. Do you realize that a 40-foot wing span jet, head-on at 10 miles, is no larger than a flyspeck? Unless your eyeballs are focused directly on it, even under perfect conditions of visibility, you'll never see it.

Failure to avoid tangling in midair, even after sighting another aircraft on a collision course, entails many factors. At today's higher speeds, closing rates leave little or no time for action. Total reaction time for evasive maneuvers includes time to sight and recognize the other aircraft, become aware of collision course, make decision to turn, muscular reaction, and aircraft lag time. Makes one think, doesn't it?

The last point, that of recognizing an impending midair, but failing to take positive action, can normally be attributed to flight stresses. All naval aviators are well trained to react positively in emergencies—but what about the individual whose mind and body are clouded with fatigue after a long tiring hop? Would his reactions be the correct ones? . . . How about the effects of hypoxia, noxious fumes and other factors which affect the pilot's physiological makeup? These cannot be overlooked any more than if he were dulled by self-administered drugs or alcohol. Every induced factor, no matter of what nature, adds seconds onto the total reaction time; some of them, even though the pilot sees and recognizes an impending collision, preclude any action on his part.

A compilation of the FAA for a recent five-year period states that 54% of 92 reported mid-

airs, occurred within one mile of an airport, and 90%, within five miles. These facts are understandable. We all realize that the demands on a pilot, both physical and mental, are the greatest during takeoff and landing evolutions. Pre-landing check-off lists and actions account for many seconds of eyes in the cockpit, away from the place they should be—looking out for other traffic. Fatigue should also be considered at this point; the end of a long flight, senses and reactions are dulled. Added to this is the fact that the field area is the focal point for all the traffic in the area and you therein find the answer as to why 90% of the accidents do occur within five miles of the station.

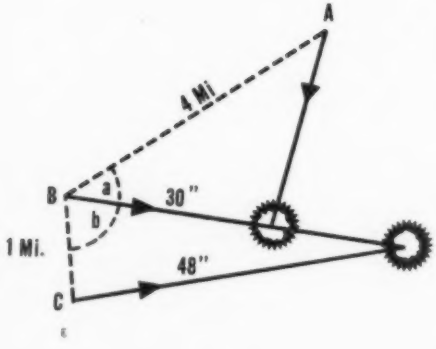
So once again, Buster—think it over. That character who just missed you on takeoff this morning had been out on an all night flight; he was tired and not too attentive; you were busy in the cockpit. The *Bonanza* you didn't see 'till the last minute because of the visibility out of your cockpit combined with the fact that you had your mask and visor in place. That "swift shadow" was a *Crusader* at Mach 1—a degree more nose down and neither of you would have known what happened! And the *Cougar* you cut out of the pattern — you knew better, you saw him, but you were a little weary and had a headache for some reason or other, so you didn't quite use good judgment and darned near hit him. These explain a lot of things, do they not?

Flying these days is a full time job; not just when you're in the air, but all the time. You've got to be physically and mentally sharp 25 hours a day, or someone will eventually figure you as a statistic.

Once again, how *WAS* your day?

This article was written by LCDR H. G. Goben, USN, while he was attending the Navy's Aviation Safety Officers' Course at the University of Southern California. ●

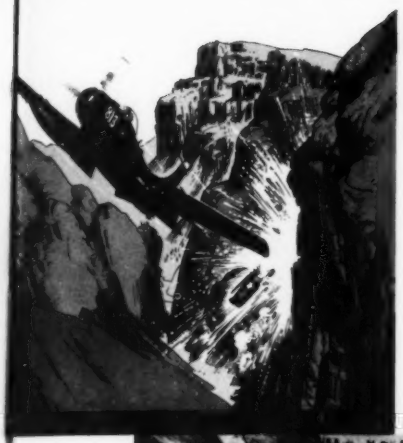
COLLISION COURSE FACTORS



A slowly changing angle of closure indicates a close approach to collision conditions. This can be especially dangerous because a last moment "correction" by either pilot could convert a potential near-miss into a mid-air debacle. An avoidance maneuver should follow promptly any recognition of danger, and should be made to increase the angle of closure.

A new factor crops up when two or more aircraft intrude into your airspace. Distance, speed and course judgments become complicated. Closure time, the ratio of change to closure rate, is the important variable. Closure time is the time it would take two aircraft to collide if both continued the approach at a constant closure rate. The problem is to single out the greatest threat.

The accompanying diagram shows the courses of aircraft at A, B and C, traveling at 300 mph with closure angles "a" and "b" constant. Aircraft A and B, separated by four miles, would close in 30 seconds. Aircraft B and C, separated by one mile, would close in 48 seconds. The closest aircraft is not always the greatest hazard.—*USAF "Flying Safety"*



SPLIT DECISION

Flying into this canyon, three pilots suddenly faced an unbriefed situation. Each reacted and maneuvered differently.

SNOW showers, turbulence and low ceilings in the mountains had caused one cancellation of the low level nav flight. On this day, weather had improved but if it appeared the 3-plane flight of ADs could not make it through the mountains safely, the briefing called for a 180-degree turn and return to base.

The first portion of the flight was uneventful and upon approaching the mountains a 300 foot-per-minute climb was commenced. Over the foothills of the mountain range there were scattered cumulus with bases near 8000 feet. Coming into the mountains proper the three aircraft turned and followed a deep valley which led partway up toward the summit. Sky cover here had thickened to a broken deck and though the cloud bases were level with the valley rim prominent peaks could be seen through breaks in the cloud deck. Climb

was continued until just below the clouds. Speed was 150 knots.

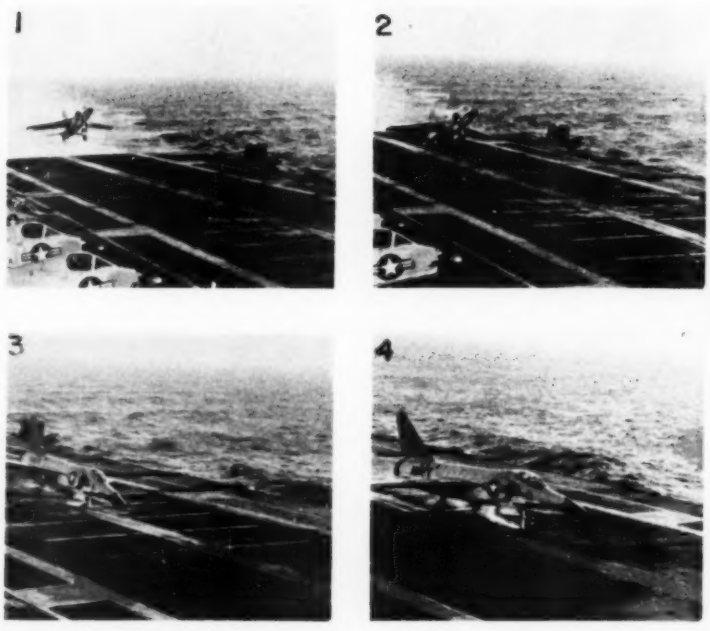
"Everything seemed to be going fine," number 3 man said, "when we came around a bend in the valley and saw that it was a dead end with the ridges in the clouds."

Faced with the sudden fact of having flown into a blind canyon each pilot reacted differently. The lead pilot called "rated power" and then a moment later "flaps." This command concerning flaps was apparently not heard by the others in the flight.

With full flaps the lead pilot pulled into a wingover type turn, passing through the edge of a cloud as he did so. By using flaps a turn of extremely small radius was possible. He reported his speed in the turn as 90 knots.

Number 2 had eased to the right of the valley for greater maneuvering space and he started a level turn of about 45 degrees bank, apparently without flaps. After completing 90 degrees of turn the wing struck the steep side of the valley.

Number 3 pilot, having witnessed the crash, did what he considered the only thing possible. He leveled the wings and elected to try to get over the top of the ridge. Climb airspeed was 110 knots. Right on top of the ridge he entered the clouds, then in about 5 seconds, broke out in a clear area.



An LSO waveoff, full power and rotation brought about picture number 1. In number 2 the wire is caught with the jet beginning to climb. Pictures 3 and 4 show return to the deck and runout.

HOOKED—During his third carrier qualification flight, the pilot of an F11F had made one arrested landing, one bolter and one waveoff due to a fouled deck. On the next approach he intercepted the glide slope high, corrected to get back on, and had an "on slope" mirror indication for three-quarters of the glide slope distance.

The sea state was reported slight with a pitching deck. Although the degree of pitch was not considered to be a contributing factor in the accident that followed, it had a distracting influence on the pilot's technique. "As I got in close," he said " . . . the mirror indicated that I was high, due to a pitching deck. I corrected for the high, in doing so I dropped my nose."

As the aircraft approached the ramp it was below the proper glide slope and the LSO gave a waveoff by mirror lights and radio. Pilot response was 100 percent power and rotation of the nose "to a very high altitude." Although the attitude changed the altitude did not and the hook narrowly missed the ramp. Clearing the ramp, the aircraft started to climb but the hook caught number 1 wire for an inflight engagement. The resulting impact broke off the nose wheels and caused substantial damage to the nose wheel well.

Several comments from the chain of command concerning initial carrier qualification landings are worthy of note: "This accident," said one " . . . points out the necessity of impressing young pilots with the importance of flying a constant speed, constant rate of descent mirror approach regardless of the deck conditions. It is far better to take a bolter than try to outguess or follow the movements of a pitching deck." Another said, "Experience to date has also indicated that accepting bolters during this stage has had no detrimental effect upon the quality of the end product, since in every case the fleet replacement pilots have satisfactorily completed their carrier qualifications without excessive bolters during the latter periods."

RELATIVE COMMOTION—Personnel were to be transferred from a submarine by helicopter and in preparation for the transfer the Officer of the Deck ordered a course which produced a relative wind of 37 degrees off the starboard bow at 22 knots. This action was in compliance with an Instruction which stated that helicopter transfers from submarines would be made from the bow with the wind between 30 and 45 degrees off the bow with a minimum force of 10 knots.

The emphasis on putting the relative wind off the bow is to allow the helicopter pilot to hover into the wind, at an angle across the ship which then gives him an unobstructed view of the transfer area. In the case of personnel transfer from a submarine the pilot has a clear view of the sail (or conning tower as it is frequently called) with the tail rotor well clear of all obstructions.

As the submarine steadied on course the HSS-1 commenced an approach from aft on the port side. There was no radio communication between units and as the helicopter approached the bow the pilot hand signaled for a course more to the right. This was done and the helo commenced another approach from the port side with the relative wind now reduced to 12 degrees off the starboard bow at 25 knots.

The approach was made into the relative wind but when hovering over the submarine with this angle the pilot (right seat of the aircraft) was unable to see the sail of the submarine. Almost before it was evident that trouble was starting the situation was "in extremis." A drift to the right had commenced which also reduced the distance to the sub's bridge. Corrective action was ineffective in salvaging the approach. The tail began to swing in toward the bridge slowly and all personnel on the bridge crouched down. An observer there noted that the "tail wheel began to go up and it appeared that the helicopter was rising to clear the bridge and sail area. The helicopter was still rising when I heard a loud 'pop' as if a large lightbulb was breaking.

"The helicopter then became erratic, rose into the air, veered sharply to the right, cut its engine and plunged into the sea about 50 feet off our starboard quarter. Three men were seen to get out of the aircraft before it sank out of sight."

The tail rotor had struck the masthead light shield above the bridge and damaged the rotor to the extent that full control was lost.

Although there was a divergency of opinion concerning the exact degree of relative wind for optimum operations, everybody concerned, including the pilot, agreed that the relative wind should have been further toward the beam than the existing 12 degrees off the bow. Thus, it was the opinion of the board that the accident was caused by the pilot attempting to make a personnel pickup with the relative wind too much in line with the submarine's course. Had he attempted the transfer with the wind condition originally set up by the sub the accident might have been avoided.

RUFFLED FEATHERS—A P2V-5F had just come out of its 11th major check and a crew was assigned for the test hop. The pilot was a designated PPC and had the experience of 8 previous test flights.

Takeoff was made in early afternoon and the P2V climbed up through lower scattered cumulus to CAVU conditions at 8000 feet. Shortly after leveling off the pilot asked if the copilot had recently made a feathering check on the engines. The copilot said "no," so the pilot turned the controls over to him and started the check. At this time the aircraft was below single-engine weight; however, the jet engines were not started.

Both engines were run up to 2600 rpm and 46 inches. The manifold pressure was reduced to 17 inches on the starboard engine and it was feathered. The pilot reached to the pedestal and brought back a mixture control but by mistake he cut the *port* engine. Upon realizing his error he ran the port mixture control to FULL RICH—thereupon, with a banshee wail, the engine oversped to 3270 before the governor returned it to 2600.

Obviously upset by the situation the pilot decided to unfeather the starboard engine. After eight blades on the starter he pulled up on the unfeather button. The mixture control was put in FULL RICH and thereupon the starboard engine fired off but wound up to an overspeed of 3110 before the governor took hold and returned it to 2600 rpm.

Poor technique was called against the pilot when he failed to consult the feather-unfeather checklist in the flight manual

before conducting the test. The overspeed of the starboard engine was the result of disregard of the SOP as he failed to toggle the prop to full low RPM prior to unfeathering. In addition, it was felt the jet engines should have been started prior to the feather check.

Both engines had exceeded overspeed limits of 3050 rpm and were removed from the aircraft in accordance with General Reciprocating Engine Bulletins 86 and 167.

THIMK — During a landing rollout, at an estimated speed of 30 knots, the pilot of a TV-2 intended to unlock the canopy (handle on the starboard side); however, he reached to port and raised the landing gear handle. The gear collapsed.

Though the pilot had considerable experience with 4000 hours, of which 750 was in jets, he had limited time in the TV-2. Some 300 of the jet hours were in F3H aircraft and it was considered that a complacent attitude permitted the pilot to revert to a habit pattern established in the F3H where the canopy lever is on the port side.

This accident, the report further noted, appears to be the result of attempting to perform flight completion acts prior to completing the landing phase of a flight. Such diversionary acts, particularly when the pilot does not fly the same model aircraft every day, can result in far more serious accidents than this.

LOW BLOW—In CAVU weather the AD-7 came booming across the flat desert valley on a run-in for the pilot's eighth consecutive low angle loft maneuver. Prescribed run-in altitude is between 50 and 100 feet but the radar altimeter was not being used and the pilot was estimating his altitude above the ground. He noted the altitude on this run did not appear to vary significantly from previous runs; however, at two miles from the target a metal flight line marker suddenly appeared dead ahead.

Before evasive action could be taken the prop clanged the marker and the AD was far down the fairway. The run was discontinued, a climb for altitude made, and the pilot immediately commenced a return to base. A normal landing was made and postflight inspection revealed a split in one prop blade.

The flight line marker was almost seven feet high but it was determined that the propeller tips were less than four feet off the ground when the impact occurred. Explaining the probable cause the pilot said, "The air was very turbulent on the run-in line and a downward bump probably coincided with the striking of the marker. It is my conclusion that my estimate of my altitude was slightly high and that, combined with the effects of turbulence, resulted in an error large enough to cause the collision."

Two recommendations evolved from the incident: 1) Use the radar altimeter for loft maneuvers and mast head bombing and 2) in turbulent air raise the minimum run-in altitude to 100 feet.

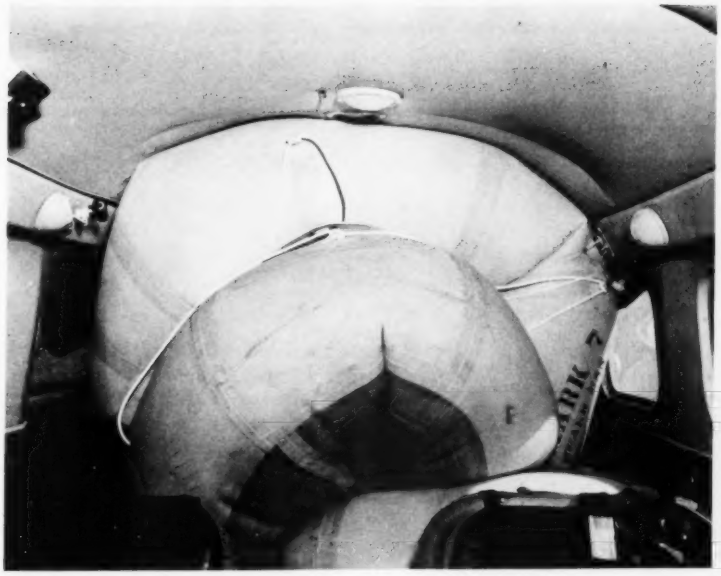
Accidents Board's Recommendations:

The nose wheel steering not be used above safe taxi speeds except in extreme circumstances . . .

NASC Analyst's Comments:

. . . If we put a section in the handbook saying that we should not use NG steering above taxi speed except in extreme circumstances, we have to describe "extreme circumstances." They are not the same to all people. Besides, most of our accidents are buildups; the pilot starts to correct for a relatively minor situation, he makes a small error, he adds a correction that contains a small error, etc. So it is easy for the pilot to figure that "extreme circumstances" do not come until the situation is practically or completely hopeless. Therefore, I believe the best procedure is to give the pilot tools, teach him about their use and their characteristics, and let that computer sitting on his shoulders make the computations necessary. If the computer does not work or if it gets its circuit too overloaded when the going is rough—it is best that we, with regret, get a new computer.

YOU WROTE THE CAPTION



THE photo here appeared in the June issue of APPROACH, with an invitation to readers to submit their idea for a suitable caption. We also asked for ideas on how to handle this embarrassing and dangerous situation.

Most of the suggestions dealt with cutting the raft open to deflate it, and only a few of them mentioned the serious hazard of introducing a large quantity of CO_2 into the cockpit of the *Beech*. "A few lusty stabs with the pilot's trusty (rusty) survival knife should do the trick," says one reader, but by all means insure that a maximum of fresh air is coming in. If oxygen is aboard (did you check before takeoff?) it should be used on 100%. One reader suggested singeing a small area of the raft with a cigaret lighter to make it hard and brittle, then poking a small hole in the singed area with a pencil, so the CO_2 could bleed off slowly.

Capt. J. T. Lawler, ComNavAirPac Aviation Safety Officer, pointed out that *Beech* pilots are noted for carrying cigarets and lunches, but not survival knives. "If you're one of those," he says, "don't overlook the most illogical place to look for a knife—in the raft's supply pocket and bailer container. The pocket is on inside of the flotation tube surface near the bow end and is attached to the raft by curtain type fasteners. Another possibility: open the topping-off valves to vent the pressure. The two topping-off valves are on the inside of the flotation tube near the midship section; each valve controls a separate flotation section of the raft, so both valves should be opened for full deflation."

One important thing that no one mentioned—it would be highly advisable to inform folks on the ground of your predicament. Whether or not you declare an emergency is questionable, but alerting the crash crew could be a life-saver if you crashed on landing or rollout with the only man-size exit fully blocked.

And now for the captions—what did the pilot say to the copilot when they looked back and saw this?

"Gad, I told Dilbert to check AFT, not the raft!"—Anonymous

"Lose something, Chief?" —CAPT F. N. Howe

"No time for ditching"—CDR W. V. Gough, Jr.

"Look ma, no exit!"—Anonymous

"Don't look now, but it's gaining ing on us!"—Mr. L. P. Jones, NASC

"Boy, I'm glad that didn't happen in the air!"—J. T. LeBarron

"Let's not look and mebbe it'll go away."—LCDR R. E. Warner

"Port engine oil pressure is down to zero, Commander." — LT N. Freeberg

"It was *your* idea to bring that %*¢@#4 thing along . . . "—Anonymous

"Isn't there another relief tube up front here?"—Anymouse

"Get me the letdown plate—it's back by the door . . . —LCDR P.F. Werner

"Look—three pounds in a two-pound bag!"—CAPT J. T. Lawler

"Tell that WAVE to change her clothes on the *ground!*"—FAETU-Pac DET. 1

"Whatinell is your mother-in-law doing *up here?*" — FAETUPac DET. 1

"M'gosh, when the old man said he wanted privacy he really meant it!"—LT W. F. Sherwood

"After you, pilot!"—CDR J. A. Camera

monitor

Visual Aid

It was suggested that high visibility paint be put on small areas of tactical aircraft where it could be easily removed, such as a strip on external tanks. It is felt that this would aid in formation flying and decrease the possibility of midair collisions; by only using small amounts of this type paint it can be hurriedly removed for missions in a combat area. The committee therefore recommended that the Wing request permission from proper authority to paint tactical aircraft with high visibility paint as described above.—*1st MAW*

Near Miss Study

It was suggested that this committee review and discuss any known "close call" and "near-miss" incidents. The committee felt this was a very good suggestion and members are encouraged to bring any such incidents to the committee's attention. The commanding officer of VMF(AW)-531 further suggested that training missions be planned to such an extent that a pilot has to meet a rigid time schedule during the entire flight thus he will be so busy there will be no time for anything else. The chairman added to this that there should be standardization—all pilots do all things the same way—according to rules and regulations. To accomplish this all leaders would have to exercise the closest of supervision.—*1st MAW*

Entry Point NOTAM

NOTAMs on "entry points" to Forrest Sherman Field will be forwarded to all fields. Although transients are not required to use entry points they become concerned when tower clears local traffic in to break from these entry points as the transient is approaching the break.—*CNABaTra*

Over- and Under-Torquing

Over- and under-torquing of screw and bolt fittings by maintenance personnel was discussed by FAW-6 Operations Officer. He stated that in one known case overtorquing had been directly responsible for an accident. The overtorquing had taken place approximately 200 hours before the accident, causing a strain that hadn't shown up before the accident. Maintenance Officers were advised to take definite measures to attempt to eliminate this practice.—*ComFAirWing Six*

Full Roll Out

. . . the practice of turning off the runway prior to reaching the end of it is a questionable one in high performance jet aircraft. It is an inducement to use more extensive braking which will increase our hot brake and tire problems. Also there is a good possibility of pilots turning on to a "near" taxi-way prior to actually having roll out speed under control thereby creating a real accident potential.—*1st MAW*

EXCERPTS FROM SOME OF THE
NAVY'S SAFETY COUNCILS THROUGHOUT
THE WORLD, WHO PROVIDE LOCAL LEADERSHIP AND
EMPHASIS TO THE NAVAL AVIATION SAFETY PROGRAM.

Delayed Relay

A "near miss" involving a P5M and an AF C-124 during instrument conditions was discussed. It was determined that the time lag involved by the local controller relaying instructions to the outbound P5M was the basic reason for the error. The P5M was cleared to climb out on approximately the same LID heading that was given to the C-124 by Approach Control. In the future all clearances will be received directly from Approach Control.—*Accident Prevention Committee, NAS, NY*

Scanner/Lookout

The committee discussed the necessity and importance of an alert, qualified scanner/lookout who serves two useful purposes in addition to any tactical need that may exist for him. He is in a position to promptly advise the pilot of engine smoke or fire and to report oil/fuel leaks. In addition the risk of a mid-air collision can be greatly reduced. In a NAVAirPac P5M Squadron credit was given to an after station lookout for alerting the pilots of fire which made possible subsequent successful evacuation of aircraft by crewmembers.—*ComFAirWings-Lant*

Chip Detector Payoffs

Four probable T-28 in-flight engine failures have been detected on the ground thus far. Present information indicates that once the metal shows on the detector, the engine breakdown is fairly rapid. This means that pilots must be instructed to hold altitude when possible and plan the approach to make a safe landing at the nearest field. The purpose of a precautionary "ELP" approach is to reduce the time that the aircraft is below the safe bailout altitude. The pilot must take the plane down at the nearest field when the light (when installed) illuminates. Even if there is an indication of a false alarm, there could be a failure rather suddenly.

The pilots feel secure with the chip detector light installed on the panel. Otherwise they are a little bit leery about the engine failures. The fields which don't have 100% installation must install this ASC 88 at earliest possible date. They're paying off in the cockpit. In most cases when the warning light illuminated, there was no indication that the engine oil system was contaminated. The pilot could have continued flying the aircraft until complete failure.

Two engines were contaminated by metal and detected by the chip detector in flight. The installation of the wiring leads to the cockpit light must be properly accomplished or false indications will occur. This results when the wiring is heated by the exhaust stack. Get them in correctly and maintain their integrity. A cross-country policy for the T-28 with ASC 88 installed should be the same as practiced in training. When the light illuminates, head for nearest prepared surface field, hold altitude or climb as conditions dictate. Do not reduce throttle as the engine tends to seize sooner when the power has been reduced. Keep power on as long as possible and make a high altitude precautionary approach.—*CNABaTra*

ANYMOUSE

SILENT SERVICE

THE flight had two objectives. One was to deliver three passengers to Pretty Hot NAS on official business and the other task was to flight check a newly reported pilot in the SNB. Dropping the passengers at Pretty Hot we two pilots went on to Super Hot NAS, landed, then returned to Pretty Hot to pick up our passengers.

After loading the passengers we started for our home station. Shortly after takeoff, at about 2000 feet above the ground, the starboard oil pressure dropped to 30 pounds. Reduction of throttle and RPM didn't help and neither did cooling the oil temperature from 75 to 65°. I made the 180-degree turn and went back to NAS Pretty Hot.

A chief in the duty section promptly and efficiently tackled the discrepancy. The engine gage unit was changed and the lines bled. This produced no improvement. I, the pilot, jokingly asked, "There's oil in the tank, isn't there?" A quick check revealed a large gaping hole where the oil should be. Seven gallons were required to bring the oil up to the normal eight-gallon level. There was no further trouble with the oil pressure.

Checking with the copilot confirmed the fact that gas and oil service had been requested both at Pretty Hot and Super Hot air stations. Each time the plane had been fueled and each time we had specifically asked about the oil. Each time we had been assured that the oil was way up. Prior to the takeoff that was followed by the loss of oil pressure, the line crewman mentioned that the oil was down a little but not enough to take a whole gallon. The intended flight was to take one hour so no concern was felt about the oil quantity.

Immediate action was to inform the line crew CPO of the situation. He was pretty convincing in his opinion that it wouldn't happen again. No longer will I request that the oil be checked. I shall request that the quantity be brought up to full, no matter how little it takes.

A final interesting "If-I'da-kept-going" note: Flight time versus oil used showed consumption of two gallons per hour. Halfway between Pretty Hot and Homebase I would have been at better than 10,000 feet over some 9000-foot high mountains. This is where the remaining one gallon would have given out.

The purpose of Anymouse Reports (anonymous) is to help prevent or overcome dangerous situations. They are submitted by Naval and Marine Corps aviation personnel who have had hazardous or unsafe aviation experiences. As the name indicates these reports need not be signed. Forms for writing Anymouse Reports and mailing envelopes are available in readyrooms and line shacks. All reports are considered for appropriate action.

— SUBMIT AN INCIDENT, PREVENT AN ACCIDENT —

OVERHEARD IN THE SNACKBAR:

"My instrument card ran out so I just file VFR through the overcast to get on top."

LOOK MA, NO RADAR

THE mission was ASW coverage over 6th Fleet units by a quartet of P2V-7s. We were to be on station from 0100 to 0800. Enroute to the ships the weather was 2 to 3 miles in haze, 2500 broken to overcast (cumulus type) with several squall lines carrying moderate turbulence and lightning.

On station the weather burned into nearly CAVU on one side of the assigned surface unit and IFR with severe squalls on the other side. Due to the variable weather the control ships assigned IFR altitudes of 500, 1000, 1500 and 2000 feet to the four patrol aircraft in the area. My flight was assigned 2000 feet on the bad weather side of the ship.

Our radar was operating continuously although the control ship had us under positive control. The airborne gear was used for checking the ship controller, search, navigation, weather, and flight safety due to the close proximity of other aircraft and the mountainous coasts of France, Italy and Corsica (After reading this the second time I wonder how we ever got along without radar anyway).

After about one hour on station the radar picture began to fade. The radar operator requested permission to make repairs but shortly he returned to the flight deck in a pall of smoke so dense that I was unable to see the navigator. All radar fuses were pulled and the set secured after which normal power was returned to the aircraft. The location of the trouble was known to the operator and no further repairs could be made (now we find out how we get along without radar).

Forthwith the ASW controller was notified of our new status and was specifically requested to keep us out of heavy weather and away from land. He said he would comply but as time passed I realized he didn't quite understand or wasn't able to comply. Once we broke out of a squall about 2 miles from the coast just as he gave the turn. On the next leg he contacted a sister ship to determine if she held me on her radar since he had lost me. I continued on the leg to the next turn, feeling rather isolated, as they discussed where I might be.

After returning to the ship for a revised search plan the first vector put me in the severest turbulence I had ever experienced. Most of the area was a solid full grown thunderstorm factory. I elected to make the 180-degree turn out of it. The turn was progressing normally although we gained some 200 feet, which wasn't too bad considering the turbulence. Then, after about 90 degrees of turn, the after station lookout who has many years of experience in flight crews shouted on the ICS "Pull Up, pull up! We're going down!"

Climb power and 10 degrees flaps were selected as I didn't know what might be causing his extreme excitement and warnings. This is where I made a near fatal mistake of sneaking a peek outside in the lightning and clouds to see if there was any rocks at my altitude. The copilot brought me back inside with the one word "airspeed." Actually he meant the lack of it—100 knots and 3500 feet, left wing slightly low but with full flaps. By the time the 180 turn was complete we were in the clear and the after lookout calmed down. A note here: The bow lookout is always secured in electrical storms.

On returning to the control ship I requested that we be released due to weather and lack of search capability (now I know about the beauty of radar). The controller complied and a normal dawn landing was made. Back on solid ground we determined that the lookout had suffered from vertigo, possibly caused by his rough ride in the turbulence. His anxiety over the electrical fire and the fact that he couldn't get to his flashlight were possible contributing factors.

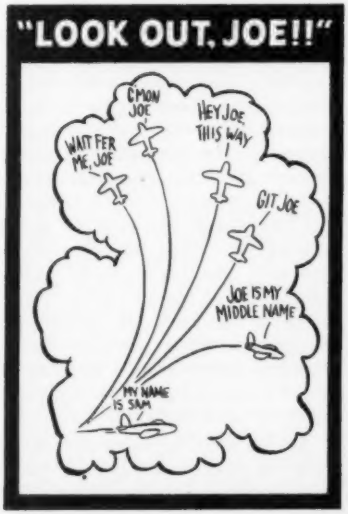
Later I had a discussion with a controller and learned some things I didn't know about the differences between land surface search and air search radar.

THREE BLIND MICE

THREE thoroughly shook Anymice must have run to their respective homes to report to Headmouse following this near accident. The story as compiled from the three Anymouse reports follows:

After having an overspeed repaired, an HRS-3 was towed onto the line for a run-in. The aircraft turned up for an hour with the rotors engaged, and then began taxiing from the line for hover time. As the helo began to move, it started spinning. The pilot immediately shut down.

It was discovered that the tail



rotor pitch control cables had been reversed, giving the pilot left rudder for right and vice versa. Murphy's Law had been applied and the three mice had failed to catch the error.

Due to extremely good luck, no one was injured and no damage occurred. Aircraft parked on each side of the HRS-3 involved had their blades folded, which probably prevented severe damage to all three aircraft and possible injury to the two pilots and ground crewmen directing them.

Each of the three reports received closed with almost identical statements; i.e. "You can bet that anytime tail rotor control cables are worked on again they'll be double checked, if I'm around."

REVERSED CONTROL

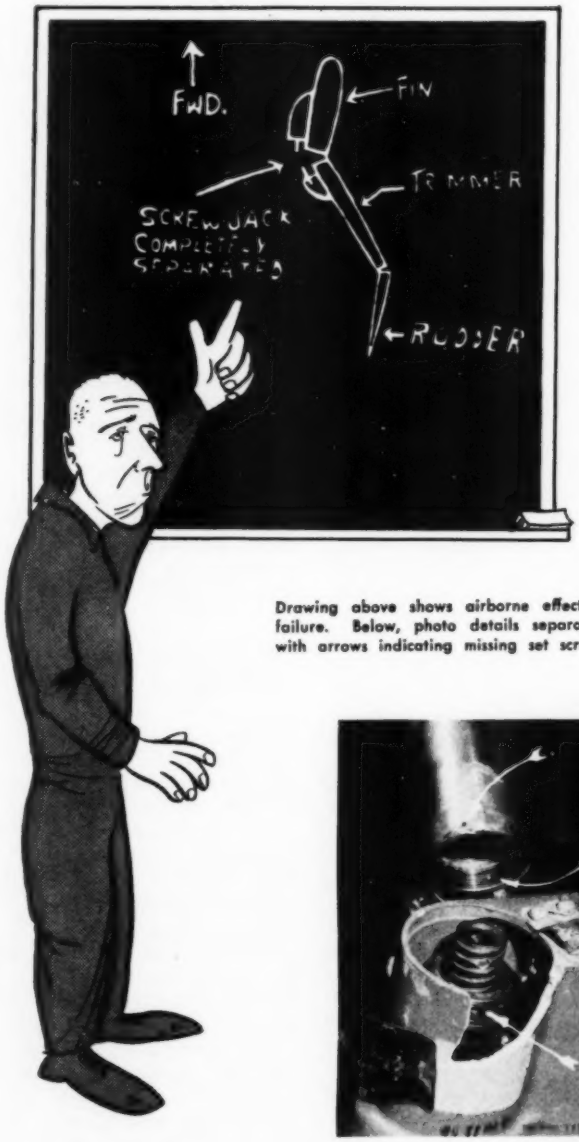
WHILE cruising at 6500 feet in an S2F the autopilot was discovered to be considerably off heading. This was surprising because it had been engaged only a few minutes. We disengaged it and used the electric rudder trim. The trim didn't seem to work so rudder pedal force was applied to bring the "ball" back to center.

Unexpectedly, the "ball" slid to one side and hung there, two-blocked. The plane went into a violent skid, accompanied by a severe roll that required almost full throw on the ailerons. The seriousness of the situation can be seen from the sequence which followed. An emergency was declared and I passed the order to standby to bailout. The plane seemed completely out of control; 4500 feet of altitude was used up (2000 feet remained), when the use of assymetric power gave a measure of control and allowed us to climb back up to altitude.

At the time we were enroute to Norfolk from New York and to let you appreciate our confusion about what happened I'll explain what was discovered on the ground after it was all over.

The electric trim screwjack had come apart completely. This means the trimmer surface was free—even the hydraulic actuator was ineffective since it acts through the electric trim (the electric trim is actually a variable length pushrod and is the last link in the chain of control to the trimmer surface; it is the bulge seen on the left side of the fin).

Rudder pedal force in the normal



Drawing above shows airborne effect of failure. Below, photo details separation with arrows indicating missing set screws.

manner would not center the ball because the rudder surface was now acting as a huge trim tab to the trimmer surface. For example slight deflection of the rudder to the left would make the trimmer go all the way to the right!

What we had was reversed control.

Meanwhile, at 7000 feet, it was found that in slow flight with flaps down the situation was much improved. Considering that big barn door of a trimmer out in the breeze, it makes sense that at slower airspeed the violent yawing effect was reduced.

Radio control was established with NAS Oceana where emergency arresting gear was available. A long straight in approach was made and even though the hook engaged successfully the S2F veered off the runway onto the grass, blowing a tire in the process. This was, however, certainly far from the serious consequences we had feared at first.

Incidentally, at no time did anyone think of the rudder acting in reverse, much less thinking that the trimmer surface had become disconnected. All we could think of was that the hydraulic part of the system had failed in such a way that it would remain only in an extreme position.

The incident came about because two set screws had not been staked in position in the electric trim unit, or had been left out altogether, at an overhaul activity. Eventually — nearly six months later — the unit came completely apart.

In conclusion, the tail surface just didn't want to assume a streamline position. If both of us had locked our feet on the rudder pedals the surfaces might have been held in neutral or close to it.

GULP

I WAS in a P2V during a night ASW exercise when an FJ pilot came up on Guard and reported a mid-air collision. He landed successfully but the other pilot concerned ejected and parachuted to a water landing. Although he was illuminated with flares he was actually recovered due to his signals with his life vest flashlight according to transmissions from the radio. It was 40 minutes from mid-air to chopper pickup.

Settling back after the event was completed I got curious and decided to check my own life vest light to see how much it put out. I got nothing. Contrary to policy my life vest was not checked out during the period of aircraft check. This was also my responsibility to see it had been done.

If it had been me down there in the water, there most likely wouldn't have been a rescue that night, at least not from flashlight signals.

CHECK OUT

THOUGH this one happened some years ago, the conditions which produced it are still around —and the conclusions are still being rediscovered.

The aircraft was a P4Y-2. After approximately 50 hours in the aircraft, which included only 12 hours actual control time, I was certified safe to solo. Shortly thereafter I was assigned instructor duty by the simple process of being assigned a copilot who had never flown the aircraft and who had never flown as copilot. In addition he had not even read the handbook or received a familiarization cockpit check.

As I went through the sequence of actions before takeoff (preflight, prestart, start, . . .) I was explaining each checkoff in detail. In doing so I missed the important item concerning ½ flaps for takeoff. The copilot and flight engineer also failed to note that the flaps were still up as I rolled into position on the 5000-foot runway.

The temperature was about 90° and though we made it off that time —after the point of no return I ignored the red lines and two-blocked the throttles—I had to get the wheels up to clear the trees off the end of the strip.

Only when I went to raise the flaps at 1000 feet altitude did I discover they had been up all the time.

My failure to use the time-tested challenge and reply system was almost fatal.

With such a small amount of time in four-engined aircraft I should not have been saddled with an inexperienced copilot to instruct.

The copilot should not have been allowed in the plane until he satisfied the handbook exam and cockpit checkout requirements.

SLIP STACK

HERE are some jewels which you may be able to use. They were overheard in several ready-rooms where the speakers should have known better.

"Boy, that maintenance is terrible. I had to use alternate air to get a decent mag check."

"I had some white smoke coming out of the engine in flight and on the deck but I'm not going to down the clunker. I'm going to try to find where it's coming from on the next hop." (Maintenance downed the plane which required a cylinder change).

Up gripe by young pilot on the yellow sheet: "Small electrical fire in flight." (Before maintenance could get to it the aircraft was back in the air.)

Then there was an instance where an aircraft quit three times in flight and was not griped until the plane went off the end of the runway on a subsequent flight. No damage to aircraft or personnel aside from grass stains on the tires. ●

Have a problem, or a question? Send it to

headmouse

—he'll do his best to help.

Shore Type Chocks

Sir:

Your April issue page 36, "New Chocks Coming" states the line secured type chock is not an approved type.

The shipboard allowance list, QG-9 specifies chock FSN R1730-602-6438-S030 for shipboard use. I understand chock FSN R1730-651-1299-S030 which you refer to will replace the aforementioned chock.

The store station allowance list, QG-17, does not specify a shore base type chock. My questions: What type chock is an approved type chock for shore use? What are the specifications?

SAFETY OFFICER
VR-31

► As far as can be determined, specifications for shore type chocks *per se* do not exist. BuAer Drawing No. 54A48 provides design features and dimensions for the new universal wheel chock which should prove helpful if you wish to make your own—a facsimile of same is shown below. Commercially produced chocks are made of aluminum. These have been tested and evaluated at NATC, Patuxent River, and are now being distributed to the fleet. Replacement of the present chocks with aluminum chocks will be dependent upon available funds.

Locally manufactured wooden chocks patterned on this design should be fabricated so no metal parts are exposed which could create sparks, in keeping with U. S. Navy Safety Precautions, OpNav34P1.

Note the curvature of the wheel holding surface of the new chock as compared to old chock, FSN R1730-602-6438-S030 (NAF 601628-1), photo below. The new chock is more effective because the curvature permits the tire to bear down on part of the chock. As the weight of the aircraft is transferred onto the chock, the friction between the chock and the deck rises to enormous values. The upper part of the curve imposes the necessary force against continued movement of the aircraft.

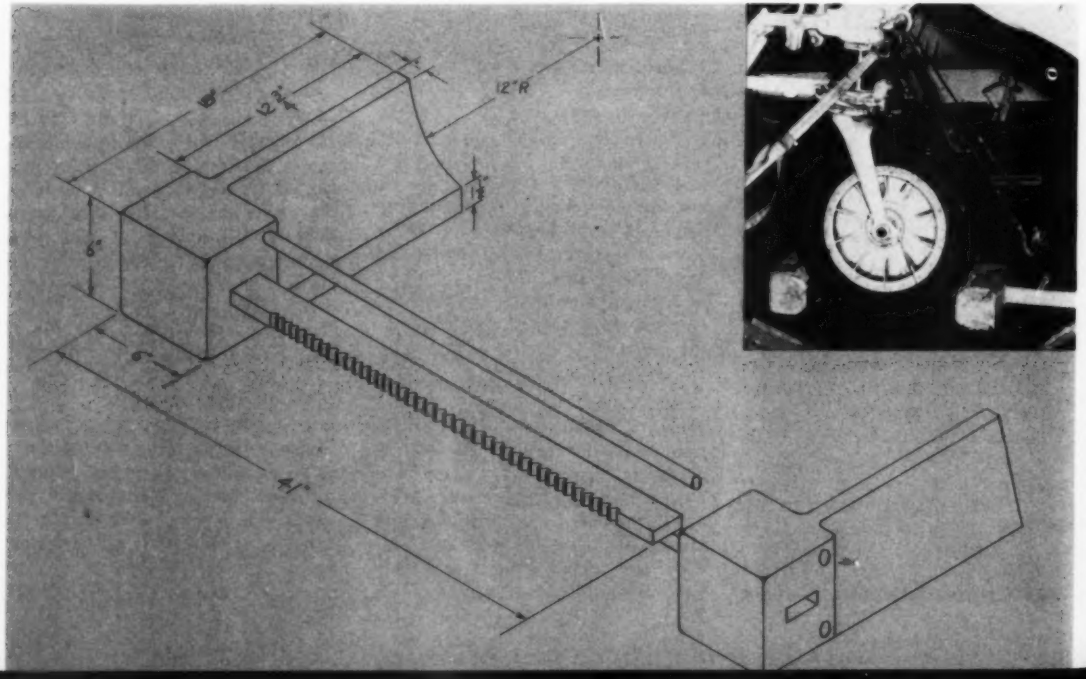
The ratchet and stabilizer bar of the new chock permits expansion to 41 inches to accommodate most Navy wheel and tire sizes. We expect, in most cases, that locally made chocks will be wooden with a fixed span substituted for adjustable features.

Very resp'y,
HEADMOUSE

Ground Checked OK?

Dear Headmouse:

Note the attached yellow sheet. The first four gripes were written



off as "ground checked ok." On my ferry test hop subsequent to this I noted the first three gripes and after landing was able to induce all of them (engine vibration noticeable on rundown).

It is my opinion that the practice of returning aircraft to an "up status on safety of flight gripes with a "ground-checked ok" is undoubtedly against some regulations and should be knocked off immediately. This practice is Navywide; at least in the areas where we ferry pilots travel (Continental US).

Specially note the No. 1 gripe. *The aileron linkage and boost connections were not even checked visually.*

Discrepancies:

1. About 2" lateral play in control column with no control.
2. Mild vibrations in plane.
3. With heater in any but cold position, smoke enters cockpit.
4. Brakes won't hold 100% rpm.

Work Done:

1. Without aileron boost on travel is less & stick has play. With aileron boost on no play.
2. No vibration felt on ground run.
3. Pressurization ground check on cold and hot position with defrost ON or OFF—no smoke or fumes.
4. On ground check brakes held 100%.

FERRY PILOT

► You're right. The regulations are: BuAer Inst. 3700.3A which states the *minimum* operating requirements for aircraft to be ferried and requires additional precautions be taken as dictated by sound judgment or as conditions indicate to insure safe flight. OpNav Inst. 3110.14 sets forth the responsibilities and procedures of activities preparing aircraft for, and delivering aircraft to ferry pilots. OpNav Inst. 3710.6A governs test and acceptance flights.

Very resp'y,
HEADMOUSE

To: CO, FASRON----------

From: Headmouse

Subj: ACCIDENT INVESTIGATION INVOLVING FLIGA SERIAL ----------

Subject FLIGA states the morning watch found a gas truck had been driven into an AD-6, that the engine was cold and the parking brakes were set and that no driver was found. The reported conclusion of the investigators is that an unknown person drove the truck into the aircraft.

This report brings to mind the incident occurring at a flight training station in which an aircraft had taken off after dark on an unauthorized flight. Shortly after takeoff the aircraft crashed but its pilot could not be located. Muster of all cadets failed to reveal any absentee, injured or shook-up cadoodlers. After a few days an airman reported to sick bay complaining of a bruised torso. A check revealed he was the sentry on watch on the night of the incident. Further questioning drew a confession of having attempted the flight.

Very respectfully,
HEADMOUSE

P. S. A more thorough investigation in the first instance may have revealed a similarity.

"To reduce maintenance problems—write up aircraft and equipment discrepancies intelligently."

Two eyes in vision...

The concept of see-and-be-seen gives at least partial protection against midair collision at cruising altitudes. Until ways and means are found to assure positive separation and to warn pilots automatically of the proximity of other aircraft, the burden of safety and security in flight must be borne by the human eye—preferably several pairs. But the head must be moved for optimum protection.

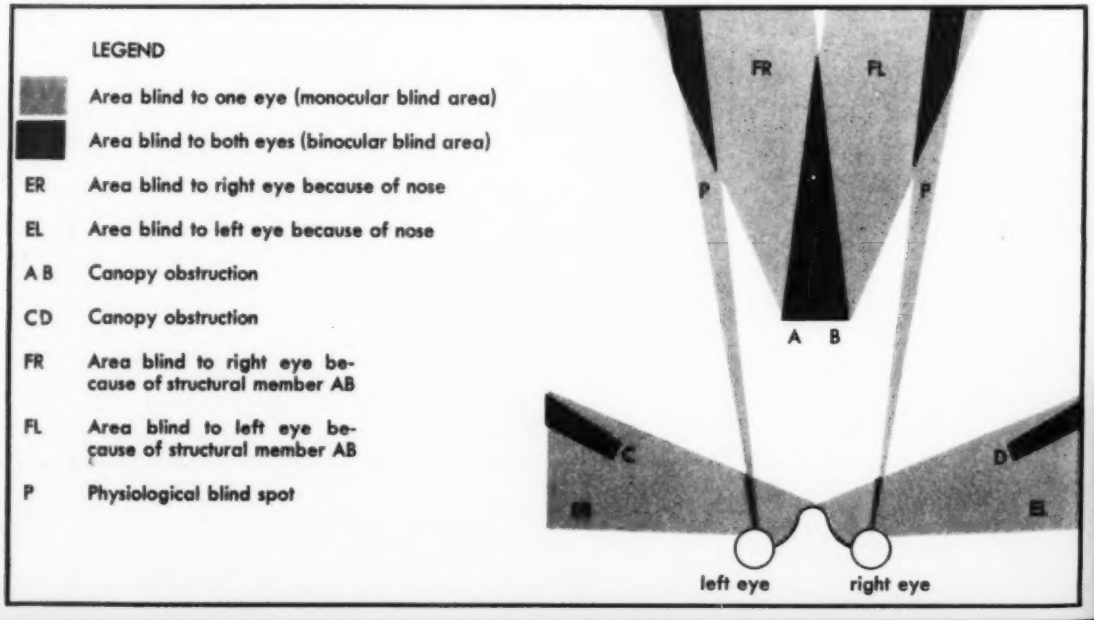
While the closure speeds of present-day aircraft do much to render the see-and-be-seen principle inadequate, there are several other conditions which further add to inadequacy. These are:

- Poor brightness contrast between an aircraft and its background.
- Lack of relative movement of the aircraft in relation to its background.
- Periphery of the retina of the eye cannot detect targets that are small (because of the angle and distance they are away from you) at a distance sufficient for detection and successful evasion.
- Combination of physiologically and structurally produced monocular blind areas which result in binocular blind areas in the search field.

That fourth point is interesting. The monocular blind area is a small area roughly 15 degrees from the center of the retina, where the visual nerves enter the eye. This area has no photo-sensitive cells and is therefore blind and insensitive to light. This physiological blind spot is about 5½ degrees wide and 7½ degrees in height and can hide a fighter aircraft, for example, until it is just a fraction of a second away at head-on, fighter-transport closure rates. The overlap of the blind area of one eye, caused by a structural member of the aircraft, and the blind area of the other eye, caused by the physiological blind spot, can produce an area not seen by either eye!

This fact was brought out by the Wright Air Development Center's Aeromedical Laboratory in a study titled "Inadequacy of Visual Search in Avoiding Midair Collisions." It advised that "Visual search should be performed almost continuously in approximately the first 30 degrees to each side, with occasional glances to 90 degrees."

In short, don't just look—move your head and see. And remember: your eyes should pause briefly at each look.



...and two in collision

The first Navy aircraft accident reported to NASC in fiscal 1960 was—you guessed it—a midair collision.

The two I's in collIsIon are certainly close relatives of the two in vIsIon. Let's face it—with electronic anti-collision devices still "out of sight beyond the next hill," with steady increases in air traffic density, and increases in numbers of high-performance aircraft—civil as well as military—the concern expressed by FAA and military aviation officials is not without cause.

In writing to the Secretary of the Navy on the subject of air traffic problems, Mr. E. R. Quesada, FAA Administrator, said in part, " . . . We must all candidly recognize the existing limitations of our control system and cockpit visibility, as well as the vast mixture and speeds of modern aircraft. We must also recognize that there is no substitute for maintaining a thorough and vigilant watch for other air traffic at all times . . . ".

While it can be argued that midair collisions are a small percentage of aviation's total accidents, we cannot arbitrarily conclude that they should receive only a direct proportion of our preventive effort. For by their very nature, midair collisions involve the military aviator (and his passengers) with the civil air carriers and corporate and private aviators—and their passengers. Like the very effective polio inoculation campaign said last year, "no one is immune"—every aircraft that flies is at the mercy of every other aircraft in the same air.

Again by their very nature, midair collisions are most often sudden and spectacular when they occur between disassociated aircraft. There is hardly ever time or opportunity for bailout nor even for a controlled emergency descent.

As military aviators we're accustomed to a certain degree of personal risk from normal operations—that's why we receive flight pay and why we pay a higher life insurance premium than gardeners or elevator operators. And the public, both in the air and on the ground, is accustomed to the fact that we expose ourselves to the hazards of military flying. They read of military accidents occurring at air stations or at sea but don't feel a personal participation in them unless they involve a friend or relative.

But—the danger of midair collisions makes every member of the general public, flying or on the ground, a very real participant in the hazard of flying military aircraft. Like the polio campaign again, "no one is immune." The young lad joyriding his wife and kids in a *Tri-Pacer*, the gent in the left seat of the converted executive B-25, and the grey-haired grandmother flying home (for the first time) in a super-G *Connie* to see her latest grandson, they're all sharing the air—and the personal hazard of collision—with the military aviator. You just can't fly with the expectation of confining your collisions to military aircraft. You can't look upon the public as detached bystanders who only read of your accidents and near-misses.

Nor can you assume that an IFR flight plan is a guarantee of an uncluttered flight path. Every train on every major railroad in the U.S. operates on a "clearance," but the engineer still watches ahead, whistles for crossings, and hopes there isn't a cow on the track just 'round the bend.

Yes, the airborne electronic devices for avoiding collisions are still beyond the hill. But the rotating beacons and high visibility paint are already with us. The great emphasis that has been placed on their adoption and use is predicated on just one thing—they have to be SEEN. And to *see* them one must be *looking*. The gaudiest, brightest, flashingest airplane in the world won't be seen if it's not being looked for constantly. The two eyes in vIsIon are still our best collision preventive. When your eyes are in the cockpit, they're a set-up for the other two I's—the ones in "collIsIon."

THE BLIND SPOT

To demonstrate the physiological blind spot mentioned on the opposite page, hold this diagram about 8 inches in front of the right eye. Close the left eye and stare at the cross while moving the diagram slowly toward the right eye. At a point about 5 inches away, the white square will disappear, and will reappear as you continue to move it closer. Move the page back and forth through this small range, and you'll see the square appear and disappear as it passes through the blind spot.

NEAR-COLLISION?

REPORT IT!

What is the instruction governing the reporting of near-collisions?

OpNavInst 3750.13

When should a near-collision be reported, and how?

Immediately following its occurrence, by radio. Upon landing, additional details should be reported on forms available at all military bases.

What if I land at a non-Navy field?

Forward a written report, via air mail, to CNO (OP534)

Suppose I have a near-collision but don't report it at all?

If the other pilot does report it, and was able to identify you sufficiently, you will likely be asked to make a statement upon landing.

To whom should I make my report?

Your initial (radio) report should be made to the nearest Navy RATCC, tower, GCA facility or any Navy air-ground communication station. Or, it can be made to an FAA Control Center, com station or tower. When you land, ask for a near-collision reporting form and fill it out completely.

What info should I give in the radio report?

Time, location and altitude, other aircraft involved, distance of miss, evasive action taken, type flight plan, weather, and any other information you consider pertinent. Might be wise to make up a gouge of these items for the kneepad, eh?

What about the CAB near-collision reporting form that I find in most Ops offices? Should I fill that out too?

The CAB's voluntary, anonymous reporting program was rescinded on 15 July 1959 by joint CAB/FAA action, as it had served its purpose in providing basic, non-identified near-collision data. The information that you now report in compliance with OpNavInst 3750.13 is essentially the same, except " . . . immunity is not the intent of this instruction . . . ". In other words, you're not just providing data, you're putting someone ON REPORT.

What happens to my radio and personal reports—do they lay around for awhile and get submitted periodically?

No siree—your radio report will be forwarded by routine dispatch to CNO (OP534) if you called a Navy facility. If you reported to an FAA facility, they report your info to CNO by phone, through a central reporting office at Washington ARTCC. These reports are not intended to pile up, they're meant to get quick action while the events and records are still fresh.

How near should a near-collision be for me to report it?

Well, if you had to take evasive action you can safely say a near-collision occurred. If you had a sudden close miss with no time to do anything, it will depend on your judgment as to whether or not you had a near-collision. As for "how close"—CAR Part 60.15 says, "No person shall operate an aircraft in such proximity to other aircraft as to create a collision hazard."

What does an FAA tower do if you report a near-collision to them by radio?

They'll attempt to contact the other aircraft if possible, and get their report, and will ask you and the other aircraft to make your reports upon landing. They'll also notify the appropriate military authority or Military Flight Service and, if the other aircraft was non-military, will arrange to obtain that pilot's report and statement through their own facilities.

Suppose I have a near-miss—oops, I mean near-collision—and I'm headed for somewhere outside CONUS?

You still make the same reports.

What if I land at NAS Homeplate and they tell me to make a statement on a near-collision and I didn't see a thing?

That's your statement then—but if the other gent can report which chart YOU were looking at and you still didn't see him, the next question might be, "how come?"

Well, suppose I was back aft and the miss occurred on my side?

Eeeeeyowww! You'd better read OpNavInst 3710.24 mister, and again be prepared for the "how come?"

I was tooling along one day near an AFB and an F-one-oh-something went whooshing up by me like a roman candle. Do I report him to the AFB or to a Navy tower?

First you look at your Flight Information Pubs and see if you weren't right smack in a military climb corridor—if you were, put yourself on report just like the interceptor pilot will do!

Why aren't the airlines' and private aircraft being painted with high-viz paint like ours?

Some of them are—you'll be seeing some liners with bright red wings before long. As for the private flyers, well, there are probably many who'd like to, but they're paying their own bills. Maybe we should encourage small plane manufacturers to offer a high-viz paint job as standard equip?

What's the final outcome of all this?

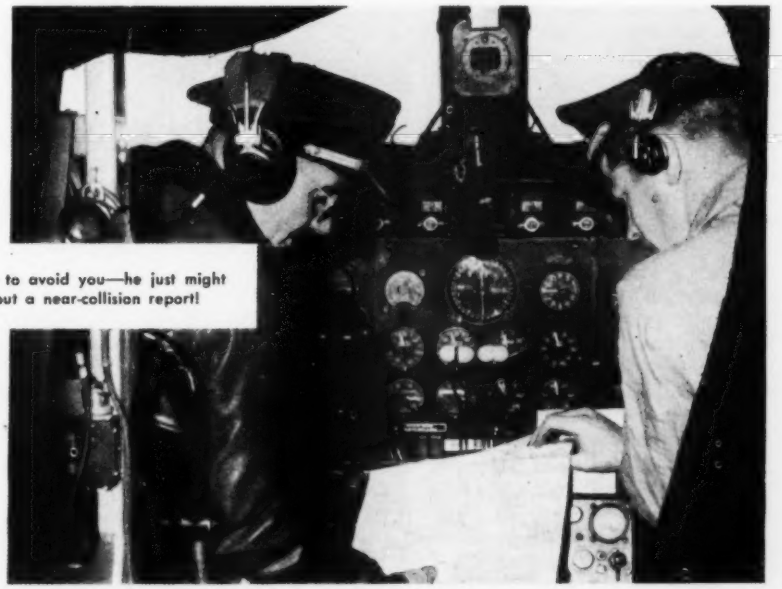
Well, we hope the eventual outcome will be no more near-collisions, but the more immediate outcome might well be fewer near-collisions because of increased vigilance. The FAA has said that, " . . . Violation reports will be filed in all cases where a near midair collision investigation shows that a violation has been committed . . . " I work for APPROACH so I don't want to talk about disciplinary action, but we know it exists.

I think this whole business of reporting near-collisions is 'way out of proportion to the problem—what a mass of messages, phone calls and paper work! Is it worth it?

You want to wait until all the near-collisions become for-real collisions before anything is done? Sure it's a time, effort and money-consuming task, but if you and everyone else watched out for everyone else, it wouldn't have to be so. We stop you from making wheels-up landings by posting a lad with paddles on the field, now, have you got any quick, cheap solution for preventing collisions and near-collisions?

Er, ah, umm . . .

Okay, just keep a good lookout then. Remember, a midair can ruin your whole day . . .



. . . Don't depend on the other guy to avoid you—he just might have his eyes in the cockpit—filling out a near-collision report!

THE WAY DOWN

"This man's experience during the free fall is a valuable contribution. The euphoria he experienced is most noteworthy."

—Reporting Flight Surgeon

The following narrative is the verbatim report of an A3D crewman who bailed out over land at night. The aircraft was vibrating severely and seemed about to go into a spin; the starboard engine appeared to be on fire. Suspecting the approach of structural failure, the pilot gave the order to abandon the aircraft. The narrator was the second man to go:

"I WENT down the bailout chute in a feet first, prone position and immediately encountered a brief coldness and a great pressure over my body and a larger pressure on my head and shoulders. At this time I also observed a very bright flash for a short instant which I supposed was the fire from the engine.

"After hitting the slipstream, I either drew myself into a position with my knees against my chest or I was knocked to this position. However, I felt at the time that this was the best way for me to fall. I also had the feeling I was increasing in speed as I hit the slipstream. Soon, however, I began to slow down and a movie I once saw came to my mind. I tried the method they had used to make the fall controllable by straightening to a stiff prone position. This pulled me out of the backward somersaults I felt I went into when I cleared the plane. During this time I was experiencing the most wonderful feeling I have ever had about being alive. I felt as though I was entirely trouble-free and in a wonderful new world.

"After coming out of the somersaults I fell, I believe, nearly the same amount of time in the position of face up and head first. In this position I felt entirely relaxed and thought of how it would be to get home again and to see my wife. My mind then went to watch ____ City come up and disappear on the horizon. This interested me, but then the movie came back to my mind of the pilot seeing the same view only in daylight and in technicolor. It then hit me that I was doing cartwheels and this alarmed me. Then the Tech Sergeant at the low pressure chamber and his swimming motions to get out of cartwheels came into my mind. I did a spread eagle and began to swim like I was under water and slowly ____ City came on the horizon and stayed there. I continued to fall in this spread eagle position, face down, head high and at a slight angle, and again became entranced with ____ City and its two bridges side by side.

"I then experienced a great jolt and could not understand what it was. The parachute had opened. (Previously in my fall I had thought of my chute and remembered the barometric release. I then thought no more about it.) After realizing that my chute had opened, I again experienced an even greater feeling of how wonderful it was to be alive and so far from that plane. My mind again returned to home and I knew I had it made to get there. I then seemed to breathe deeper than I ever had and also it seemed as though this was the first time I had breathed since my last breath in the plane.

"At this time I experienced cold air on my face and my hands got cold. I looked at ____ City and stuck my hands between my legs. I thought of frostbite but didn't give a damn. I was alive.

"I had difficulty in breathing now and thought of my bailout bottle, but I didn't need it now as my barometric release was supposed to get me where I could breathe. So I pulled the bottom of my mask and took a couple of gulps of air. I thought I was too high yet to take my oxygen mask fully off as my face might get cold.

"Then I noticed a sharp pain in my neck which I soon realized was the harness of my chute and it was bending my neck down excessively. I tried to correct this but couldn't loosen the chest straps. I was alive so why start fooling with things?" (His difficulty was due to a poor-fitting and poorly adjusted harness.)

"I attempted to look around but the harness only permitted me to look forward and down and with a lot of effort, slightly up. I did manage to look up slightly once and saw a plane go by not too far away. (However, at the time I did not realize this, but now I remember sound coming from it. However, from its lights I did know it was headed south in reference to ____ City). This was all I was able to observe of any life in the air.

"I began to give off slight grunts and groans and experienced more difficulty in breathing which I knew was caused by the quick-disconnect fitting on my oxygen mask. I again pulled slightly on my mask and got more air. I now had a terrific thirst for water and wished the chute would drop more rapidly. Again I felt that I was alive so why want anything?

"I then began to look for some area to land in and those two bridges in ____ City looked very good. So I began to tug at the right-hand riser of my chute. Somewhere in my fall, while the chute was open, I went through three stages of pendulum motion but paid no attention to them as I was too high for them to bother me.

"I tried three or four times to pull the right-hand riser so as to drift for the bridges in ____ City. I gave up as I was still happy with things as they were plus the fact that it made me tired.

"I had a few more attacks of extreme thirst but they didn't last very long." (This was probably the result of unconscious hyperventilation.)

"I gave up on ____ City as a good spot to land and looked for

a highway. I saw no great amount of traffic but even a little looked good to me. I was too tired to pull the risers now and any place I landed was okay with me.

"Earlier I had felt warmer and warmer air hitting my face so I removed my oxygen mask.

"My chute harness was giving me more pains in the neck and I swore at the riggers for it. Then I swore because I didn't have a drink of water. I included the guy driving down there in his car on the highway. I was then, I believe, slipping somewhat into shock as this great feeling of being alive left me. I felt that I could cry if I tried but I gave only a few moans and let it go at that.

"Now the land below me was breaking up fast. I could see what type terrain it was. I felt glad when I realized it was some type of a crop field but it was a long way to go for help from the nearest house I had seen. I then saw what I thought was a road but slowly it became a small lane and later it turned out to be a water ditch. (This I learned after I landed.)

"I saw the house again; then the ground seemed to be coming up quite fast, and I relaxed somewhat to hit. I saw a small treetop go by me, then my feet hit the ground. Before I realized anything further, my PK-2 hit and I got a slight jar. I rolled onto my back and for the first time I saw the beautiful white canopy of my chute. I collapsed it by pulling the bottom cords before it had a chance to drag me.

"On the last part of the chute ride, I thought I would just go to sleep when I hit the deck. Now that I was here, I could only think of getting out of it. I lay on my back while unbuckling.

"As soon as I had undone my straps, I rolled over on my stomach, got to my feet and *charged* for the lane which turned out to be a water ditch. I stumbled back onto the field and ran a very short distance the wrong way. I then stopped to see if the farmhouse I originally headed for was still the closest. It was, so I turned around and ran for it.

"On the way there, I thought of fences and knew if I came to one that I would just fall across it and that would be it. I would never be able to go further. No fences! Then, as I approached the house, I thought of a dog. If he didn't knock me down, I would be able to keep going. I felt that I wouldn't even know if he was tearing me to pieces. No dog!

"I reached the back porch of the house, knocked on the door and leaned against the wall or cabinet or something until the farmer came.

"I stumbled past him and fell into one of his kitchen chairs without saying a word to him. I do not remember his exact words nor could I say anything. I finally got the word 'water' out to him and he gave me a glassful. I could not make my arm move the glass to my mouth in the first few tries. When I did, my mouth would not function nor could I take any of it into my mouth. Finally, I got out the words to 'call someone.' He mentioned 'Sheriff' and I signaled him 'Yes.' I was still unable to speak other than parts of words. I finally got some water down and in a moment I was able to stop shaking, and said I would talk to the sheriff . . ." ●

'FLIP' QUIZ

(Flight Information Publications)

1. Does the Enroute Supplement list all fields available to military aircraft?
2. Facilities are listed in the Enroute Supplement:
   a. by state as in the old Rad-Facs
   b. alphabetically
3. Does each organization receive all the Enroute Low Altitude charts as issued?
4. A box around the name of an airfield on the High Altitude Enroute chart means what?
5. Low Altitude Enroute charts have the same detail as the Low Altitude Arrival charts. True? False?
6. Are the symbols used on all charts, High Altitude, Low Altitude, Terminal plates the same in each publication?

See answers page 48

"Whaddaya mean, read the HMI?—This here bolt fits this here hole!"

GOOD TRY!

SOMETIMES a rescue can be as hairy as the aircraft accident which necessitated it.

On a fam hop in an F8U-1, the pilot was ejected after his canopy blew off at 21,000 feet. Probably ripped open by the wind blast, the parachute deployed immediately although the aneroid was set for 10,000 feet. The semiconscious pilot descended safely and landed in a small canyon.

Meanwhile, an HUS-1 on a routine training flight had picked up a *Mayday* call on guard channel broadcast by the F8U-1's chase pilot. Contacting the tower, the 'copter asked if it could be of assistance and was vectored to the scene. Spotting the pilot descending at 3000 feet, the 'copter altered its course and subsequently located the parachute in some thick brush halfway up the side of the canyon. The pilot was lying face down and motionless in the bushes.

The situation seemed to call for immediate and decisive emergency action. The helicopter was not an SAR aircraft and on its field practice mission did not carry a crewman. Since there was no place for the helicopter to land, it was decided that the copilot would drop from the hovering helicopter to go to the unconscious pilot's assistance.

As the helicopter hovered over a nearby ridge, the copilot, carrying a survival knife between his teeth, climbed out of the cockpit and down to the step on the wheel strut, swung on the cabin door ladder and let go into the bushes 10 feet below. The bushes broke his fall and he quickly reached the pilot.

The pilot was tangled in his parachute harness, his legs doubled underneath his body. He appeared unconscious although his eyes were open. The helicopter copilot cut him out of the parachute harness to aid his breathing and cut the tangled chute risers. The pilot regained consciousness; he did not appear to be hurt.

The helicopter copilot signaled to the 'copter pilot above that everything was okay. However, the 'copter pilot could not make out the hand signals and after two passes decided to drop down into the canyon for a better look. When he saw that the downed pilot was all right, he added power but the engine did not respond and the 'copter started settling in. The main rotor blades contacted the brush and the 'copter collided with the ground.

The helicopter copilot heard the 'copter approaching with the engine making loud popping noises and losing power. He gave the pilot a wave-off, pushed the F8U-1 pilot to the ground and threw himself down beside him. The 'copter's main rotor blades contacted the bushes above the men and as the aircraft settled into the steep bank of the canyon, the blades cut the small trees and brush only a few feet below them. The canopy of the F8U-1 pilot's parachute was picked up by the rotor blades, ripped to bits and flung over the entire area.

The helicopter pilot climbed out of the plane unhurt. The F8U-1 pilot received a cut and broken finger from flying debris.

Realizing that the helicopter could explode at any minute, the two rescuers helped the F8U-1 pilot up and assisted him down the canyon slope. When they reached flat ground, the 'copter pilot went ahead to the road for help and the trio was picked up by a deputy sheriff's car and taken to the air base.

Re safety equipment used: the F8U-1 pilot heartily endorses boondockers which protected his feet and ankles when he landed in the cactus. The 'copter pilot credits his safety belt, locked shoulder harness and APH-5 helmet with saving his life during the violent movement of the aircraft during and after impact.

The AAR board concurred with the helicopter pilot's decision to render assistance in that he was airborne in the vicinity of the crash. The decision to land one pilot at the scene of the injured survivor was justified since the injured pilot's appearance from the air indicated the need for immediate aid. The risks involved by the copilot's actions were outweighed by the fact that a human life might be at stake, the AAR Board said. ●

FOUR IN THE WIND

DURING climbout from takeoff on a radar navigation flight, an A3D-1 experienced an in-flight explosion and fire in the port engine due to material failure. The pilot continued in a right turn intending to land immediately. Reconsidering, in view of the aircraft's heavy weight, he ordered the crew to bail out. The escape chute was opened and the crew abandoned the aircraft. The pilot stayed with the aircraft, directing it away from populated areas, and bailed out at 400 feet by throwing himself backward out the escape chute and pulling the ripcord at the same time. Almost simultaneously with parachute opening, the pilot struck the ground. He was uninjured except for cuts and bruises.

All three crewmen landed successfully in a river where they were rescued uninjured by the station crash boat and civilian boats.

The aircraft exploded on impact in a large vacant lot.

Each of the four men came out of the accident minus his helmet:

Pilot: Although equipped with a nape strap, the pilot's APH-5 came off when his head hit something in the escape chute. His helmet chinstrap had been removed when the Hardman connection was installed. He was wearing his visor up.

Bombardier/Navigator: In spite of a tight chinstrap, the bombardier/navigator's APH-4 helmet came off in the slipstream prior to chute opening. The helmet had no goggles on it. He retained the inner liner.

Third Crewman: The third crewman left his APH-5 helmet in the aircraft when he saw the man bailing out ahead of him lose his. (He was not wearing his life vest in flight and had to stop to put it on before he bailed out.)

Observer: The observer's APH-5 was torn off in the slipstream. His helmet had a nape strap and a chinstrap, the latter loose. He was wearing his visor up. His helmet did not have a Hardman suspension.

Among the flight surgeon's recommendations on the case are:

- That all squadrons be informed of the need for retaining the chinstrap on the APH-5 helmet when the Hardman connection is installed if any flights or portions of flights without oxygen are anticipated.
- Re-emphasis of the importance of the helmet chinstrap being tight and the visor or goggles being worn over the eyes at bailout.
- That the APH-5 helmet be made more readily available to all crewmen.

notes from your FLIGHT SURGEON

" . . . It Saved My Life"

AN F3H-2N was returning to the carrier after a routine training hop. On the downwind leg, the pilot noticed he was losing altitude and added power. When nothing happened, he checked the instrument panel and saw that he had a nozzle failure. He made two unsuccessful attempts to ignite his afterburner, then prepared to ditch. The violent impact with the water threw the pilot to the left; his head struck what he believes was the open canopy. He evacuated the cockpit and a few minutes later was rescued by helicopter.

The pilot credits his APH-5 helmet equipped with nape strap and Hardman suspension system with saving his life:

"Initial impact with the water felt extremely severe and apparently the plane started a slight swerve to the right because I was thrown violently against the left side of the cockpit," he states. "My head slammed against what I believe was the open canopy and I blacked out for just a second. It seemed like the plane was never going to stop because my head banged against the left side three or four more times although not nearly as severe as the first time. I sincerely believe I would have been knocked unconscious when I first hit the water if I had lost my helmet. However, the helmet stayed on until I removed it when clear of the airplane.

"A subsequent examination of my helmet revealed several deep gouges and a slight crack on the left side.

"All pilots' helmets in this squadron have the nape strap installed and we are all using the Hardman fittings for our oxygen masks. I cannot overemphasize the importance of commanding officers' insuring that their pilots have the nape strap on their helmets in accordance with current instructions. I feel that it, along with the Hardman fitting, saved my life."

An Extra Tug

"THE pilot remembers his shoulder harness and lap belt were very tight. He had given the straps an extra tug before takeoff and this fact may well account for his survival in the water crash."

—Flight surgeon in MOR of AD5W crash

A Major Error

AN F8U-1 pilot ejected after losing control of the aircraft in an inadvertent spin on instruments while flying in overcast. He made a successful parachute descent and water entry, released his parachute and inflated his life vest. However, after inflating his life raft and climbing in, he made a major error: *He removed his life vest.*

The pilot was rescued by helicopter 2¼ hours later. When the helicopter arrived at the scene, he left his life raft and swam to the sling.

A man in a water survival situation should not remove his life vest under any conditions.

Ripped Chutes

THE following is quoted from a recent BuAer endorsement on an AAR in amplification of a comment by the AAR Board concerning a torn panel of a parachute. This comforting fact may not be generally known.

"It is not considered uncommon for a parachute panel to rupture during a normal low-speed bailout. This is due to the random deployment of the parachute canopy from the time it leaves the pack until opening shock. The canopy, being flexible cloth material, can and does (in some cases) deploy in such a manner to cause high load concentration on a particular area, thereby causing failure of this area. Such individual gore ruptures are seldom detrimental to the parachute performance."

Knife Needed

THE pilot of an F4D-1 during day carquals reached a bingo fuel state and headed for the beach using the S-2 compass reading. The compass was in error approximately 180 degrees. When the pilot discovered the error, he headed back to the ship. The aircraft flamed out en route due to fuel exhaustion. The pilot ejected successfully with no injury and was picked up by helicopter some 5 to 10 minutes later.

Between ejection and pick-up, however, the pilot had some bad moments.

"The canopy went off and the seat fired," he states. "I looked from under the curtain and saw the plane below me. I was not tumbling and became free of the seat. Moments later, my chute opened automatically. My right arm had somehow become snarled in my pararaft lanyard and was completely useless. I made several unsuccessful attempts to free my arm. I unbuckled my chest buckle and put my left hand on my right leg quick-disconnect so I could open it quickly as soon as I hit the water.

"After entering the water, I was dragged for some distance on my back before I collapsed the chute. I got my leg straps off but had my left foot tangled in shroudlines. I was attempting to get my pararaft out of the seat pack but was unable to do so. I struggled with it a few minutes and was unable to release it, all the while becoming more tangled in the shroudlines. I finally let go of the raft and struggled free of the shroudlines. My life

vest supported me satisfactorily."

When the pilot saw a B-47 circling overhead, he used his dye marker and fired a smoke signal. He fired a second smoke signal when he saw a helicopter approaching and was picked up shortly afterward.

This pilot was not carrying his sheath knife. Although in this case the pilot managed to survive, many times the availability and use of a survival knife can mean the difference between life and death. It is recommended that all flying personnel carry sheath knives with them at all times on all flights.

(The Federal Stock number for knife and sheath is R5110-098-4327-S231.)

Firefighter

THE pilot and two crewmen of an HSS-1 ditched after losing directional control of the aircraft. The pilot went into autorotation but was unable to stop the spinning. The aircraft crashed in a nose-high attitude, skidded to the right, and sank in less than 10 seconds. Fire immediately spread on the water forcing the escaping crewmembers to swim under water to avoid the flames. There were no injuries and all crewmembers were rescued within 12 minutes by the other helicopters in the flight.

Investigation brought out the fact that the pilots in the helicopter squadron were unaware of the firefighting potential of the rotor wash in combating surface gasoline fires.

When a helicopter hovers over gas or oil burning on water, the rotor wash will blow the burning fluid to either side, parting the flames and creating a clear rescue area into which the sling or seat can be dropped. *See comment and photo below.*

Handling Crew Fatigue

THE engines of a number of AD-6s spotted aft on the flight deck were started in preparation for a 2000 launch. Ten minutes later, the aircraft started taxiing forward. During this period, the young plane handler was engaged

Unfortunately, the rescue pilot in "Firefighter," above, did not know the procedures for using helicopter rotor downwash to "lay back" smoke and flames. In addition to Bell Helicopter's work in this field, the Navy, Vertol and Ansul Chemical Co. conducted a number of successful experiments at the Atlantic City NAS some time ago, as shown in the photo below. Here are the procedures used there:

a. Make approach crosswind slightly upwind of fire.

b. Establish a hover at about 15 feet altitude (rotors about 25 feet above the ground) and about 100 feet distance upwind from fire.

c. Move in on fire cautiously observing effect of rotor wash on flames and smoke. Do not let the fuselage of the helicopter get over the fire.

d. To effect a rescue move in so that the tips of the rotors are over the cockpit or escape hatch. This causes cool clean air to displace any smoke and heat in that area.

When foam is being used on the fire, it is desirable to keep back at least 100 to 150 feet to prevent breaking up the foam blanket. The advantage of the helicopter with foam is that flashbacks are reduced to a minimum.

If a dry chemical extinguishing agent is used it is desirable to move in close to the fire to assist laying down the flames and to prevent flashbacks of the fire.

For other fire fighting info, see June '56 APPROACH and BuAer Instruction 113-A "Use of Foam-Compatible Dry Chemical Fire Extinguisher."

in pulling chocks. He had been on the flight deck for some time. The moon was bright and visibility relatively good for night operations.

The flight deck chief gave the pilot of one of the three AD-6s remaining in the last row the brake signal and the chockman the "pull chock" signal. Almost immediately afterwards, he saw a figure on his left run directly into the prop of the adjacent aircraft. The accident happened so quickly that there was no time for warning or preventive action.

It is assumed that the plane handler ran aft on his own initiative to assist with the remaining aircraft. He had 14 months' experience on the flight deck and was fully qualified and reportedly a capable, conscientious, cautious worker.

Investigation showed that due to a heavy flight schedule, the plane handler had had only 4.5 hours of sleep in the past 38 hours.

"After a review of the pertinent facts," the flight surgeon reports, "the only conclusion to be drawn is that a momentary lack of alertness, possibly attributable to fatigue, accompanied by decreased visibility produced a set of circumstances which led to this unfortunate accident."

Quick Ejector Snaps

THE pilot of an F9F-8 ejected successfully after there was an internal explosion in the engine section of the aircraft followed by engine flameout and a fire external to the engine. The accident report states that the pilot had "old type fasteners—not quick-disconnect" on his parachute. He had difficulty unfastening the leg straps.

BACSEB 7-58 of 28 Feb 58, concerning identification and aircraft application of parachute assemblies, provides that all existing NS-2 and NC-2 assemblies having harnesses with the old type non-ejector snaps be modified by replacing the harnesses with ones equipped with ejector type snaps. The BACSEB states that all NB-2 parachutes shall be modified by replacement of the harnesses with harnesses equipped with ejector type snaps.

These three parachute assemblies after modification are known as NS-3, NC-3 and NB-3 assemblies respectively.

If your squadron utilizes the parachutes mentioned in this bulletin, have the required modifications been made?

Floats Face Forward

THE pilot of an F8U-1 made a successful ejection and parachute descent. On entering the water he separated from his parachute canopy by disengaging the two upper Rocket Jet fittings. (He had manually deployed his parachute.) After inflating his MK-3C life vest, he found he was floating face forward. During the parachute descent he should have disengaged the lower (preferably left) Rocket Jet fitting so as to decrease the buoyancy of the seat pack.

Lanyard Catches on Seat

AFTER experiencing loss of engine power and making three unsuccessful attempts at an airstart, the pilot of an A4D-1 ejected. On release of the face curtain, the pilot saw that the pararaft lanyard was caught on the shoulder harness locking handle of the ejection seat as the seat descended alongside and slightly above him.

"I felt the jolt of the ejection but it was not particularly severe and the wind blast was negligible," the pilot recalls. "I released the face curtain and noted that the seat was caught on the pararaft lanyard. I pulled the seat in to me and freed it from the lanyard. It seemed like several seconds had passed so I reached for the D-ring but the chute popped about the same instant I got my hands on it."

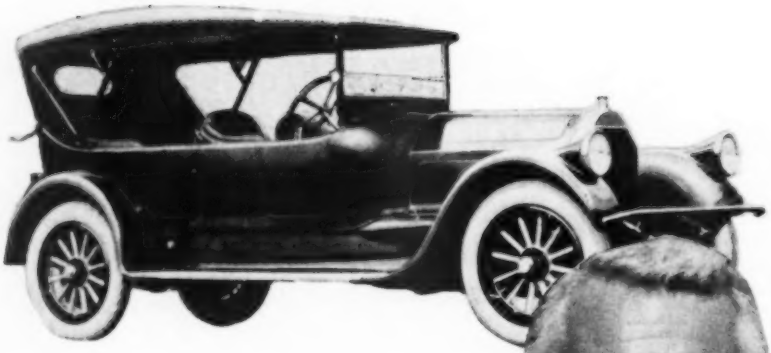
The pilot landed without injury.

"Investigation of other pararafts showed that an excess length of lanyard is frequently pulled loose from the seat pack," the flight surgeon reports. "This is potentially a dangerous situation as seen in this accident. Also the possibility exists that the lanyard could catch on some portion of the cockpit during an ejection. It was recommended that some form of restraining device be utilized to prevent excessive lengths of the pararaft lanyard from being pulled out of the seat pack."

The reporting unit's work on this problem and its final recommendations have been forwarded for consideration of BuAer. ●

Easy Pickup

"The pickup was very expeditious in that the international orange paint of the helmets the survivors were wearing aided greatly in the spotting of survivors."



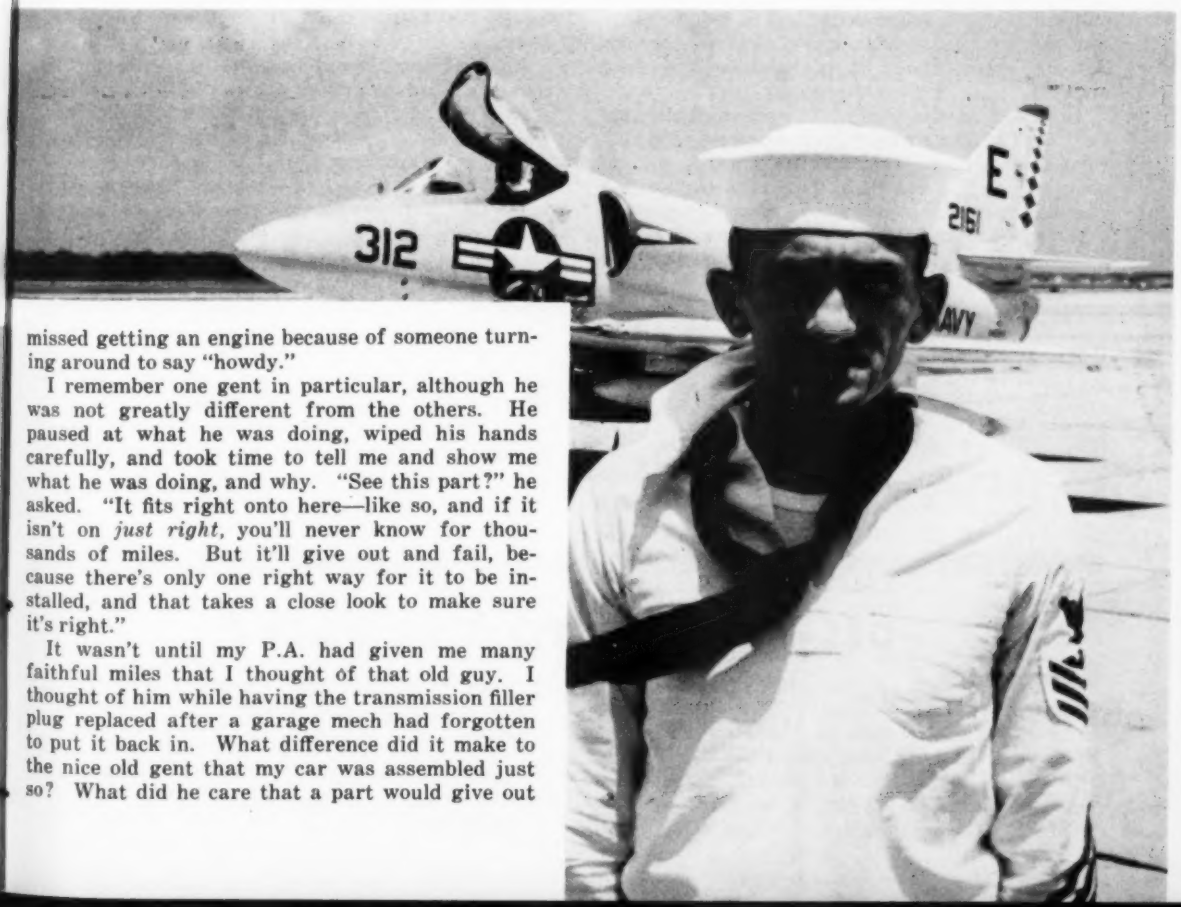
A JOB WELL DONE

" . . . ther nis no werkman, what-so-ever he be, that may both werke wel and hastily"
—Geoffrey Chaucer

'WAY back in the teens I found it possible to realize a boyhood ambition and buy a classy, brand-new car. Not just an ordinary car either, but a Pierce Arrow (saved my flight pay regularly). And having a few days leave to spend, I took a trip to the factory to pick up the dreamboat. Well, I wasn't too surprised when I got a real red-carpet treatment, including an invitation to tour the plant and watch the cars being assembled. But what I remember most vividly was watching and talking with the men who worked on the line—the pace of assembly was slower then, and no car sooner if not installed properly?

He probably cared a whole lot, I finally figured. For there are still people who are able and willing to exert just enough additional care to insure that a job is done the *right way*, and not just done, period.

Not all of them are old gents with wrinkled, smiling eyes and a short, stubby corncob pipe, either. We have some in the Navy. Chiefs and first class who've been around long enough to run into some of those nice old gents who assembled cars in the old days. Perhaps that old boy had missed getting an engine because of someone turning around to say "howdy."



I remember one gent in particular, although he was not greatly different from the others. He paused at what he was doing, wiped his hands carefully, and took time to tell me and show me what he was doing, and why. "See this part?" he asked. "It fits right onto here—like so, and if it isn't on *just right*, you'll never know for thousands of miles. But it'll give out and fail, because there's only one right way for it to be installed, and that takes a close look to make sure it's right."

It wasn't until my P.A. had given me many faithful miles that I thought of that old guy. I thought of him while having the transmission filler plug replaced after a garage mech had forgotten to put it back in. What difference did it make to the nice old gent that my car was assembled just so? What did he care that a part would give out

a son or two—they'd be old enough to be Chief by now, and I'll bet they know a thing or two about doing the job right. I'd like to have just one of them running my night check crew.

Like a choice sirloin, a job can be "well done" or just plain "done." Unlike the sirloin though, the job *well done* is disappointingly *rare*—much more rare than it used to be.

Why is this so? Why is there such a prevalent lack of pride in doing a good job? In industry, we can blame the accelerated pace of assembly; quotas and production schedules and market demand don't leave time for a casual conversation on the assembly line any more. In operations the pace has speeded up too—and even if the pace was the same, there's much more work to be done in, on and around an aircraft before it can be turned around for another flight. No more "gas it up, wipe the windshield, and off you go" sort of thing.

But the need for a Job Well Done still exists, even more so than in earlier days, for at today's speeds and stresses a small item overlooked or improperly done is far more capable of causing major disaster to an aircraft. And to its occupants. And to workers, bystanders, and even innocent citizens going about their business far from airfields.

'Way back in the days of Canterbury Tales, Mr. Geoffrey Chaucer wrote, " . . . ther nis no werkman, what-so-ever he be, that may both werke wel and hastily . . . " Even back then a hastily secured dzus fastener might leave a vital inspection panel of a knight's armor flapping in the breeze as he galloped headlong into combat. They didn't heed Mr. Chaucer's advice enough in the early days, and apparently we're still in the same rut. For every thorough, conscientious man who insures that his job is Well Done, there are several who are content to wipe it off, slap it in place, tighten it down some, and write it off. And this should not be so.

Just like the sign at the street intersection that says, "STOP" but doesn't say, "THEN GO," You stop but then you go on because you know that's what you're expected to do. When you're put on a job, whether it be a complex, long demanding one or a simple menial one, you're told to do this or that job, period; no one says "do it well," or "do it carefully." Doing the job *includes* doing it well, for if it isn't done with the proper care and attention that it requires, the job really isn't *done*, is it? The mechanical steps may be completed, but getting a job done well includes a certain outlook, a certain sense of responsibility and pride, which can only come from *your* concern with doing as good a job as can possibly be done. If a part has to be forced, *why* is force required? If a part is dirty, wouldn't a wipe remove some foreign matter or grit that might get into delicate moving parts? In fact, a wipe might just reveal a crack or score that would go un-noticed otherwise. Sure, the part may not *need* to be clean to work properly, but there's *nothing* on an airplane that works *better* because it's dirty. And if a part looks like it can be installed this way *or* that way—watch out, you may fall a victim to Murphy's Law. If it's not symmetrical but can fit more than one way, that's a clue. It was designed that way for a reason—are you *sure* it's safe to install it either way? Which is the right way?

No, Well Done is not just a trite phrase used to convey a commander's recognition of praiseworthy action. It's a Navy tradition to say, "Well Done" when something has been Exceptionally Well Done. But if we were very literal about the phrase, it should be applied to every routine piece of work, inspection, and testing that takes place—every job that's done can, and should, be Well Done. A sense of pride in doing a job well might be your only reward, for when everyone does his job well, there are no medals or commendations deserved. The reward is your own satisfaction in knowing that no one else in your squadron could have done the job any better, that you took the time, the effort and patience to insure that it was done Right, that it won't fail because of your haste or carelessness. When you can say that confidently after completing an assigned task, then you can honestly say that it was a Job Well Done.

DIS-SERVICE TO THE FLEET

Lifted from an operating squadron's dispatch to a maintenance squadron:

"Following discrepancies noted on F9F-8 aircraft received from your activities:

BuNo —— one ¼-inch open-end wrench found between engine casing and oil tank.

BuNo —— and BuNo —— bolt with nut in ground safety pin hole starboard side of seat rendered autolap belt inoperative.

BuNo ——, 18 x 30-inch rag in plenum chamber under jug. One-inch crack in inducer blade. Consider safety of flight involved."

Nuff sed!

CARELESSNESS?

Here's a frank appraisal of the term by industrial safety experts. This same catch-all is often listed as the cause of many of our aviation ground accidents. A thorough analysis of these accidents will reveal true and specific causes—only then can effective corrective action be taken.

MANY accidents which in the past have been ascribed to "carelessness" have occurred because the individual did not know the proper method of doing his job.

Assume that he knows nothing about the job. Either give him personal attention or place him under the guidance of an experienced instructor. *Tell* him how, *show* him how, *test* and *check* his knowledge of what you have told him and shown him. Equally as important as safeguarding the machinery and equipment is the proper instruction and handling of the individual.

The same instruction given a new man reporting for duty should be given an individual who has been transferred from another department. The transferred man may be aware of the hazards in his former environment, but may be entirely unfamiliar with those existing in your department. *Show* him the hazards and *teach* him how to avoid them.

If it is necessary for you to send a man to another department, make arrangements with the supervisors of that department to provide him safe working instructions while in that department.

Over a long period of time, we have held the belief — which many of us share — that the word "carelessness" is merely a catch-all and signifies little or nothing. True, the word occasionally is granted undeserved honor by its appearance in our pages despite the firm conviction that usually it is utterly meaningless as an accident-causative factor. Too often, the word merely is a synonym for inattention to safety regulations, over-confidence, poor safety indoctrination; or a simple case of buck-passing.

A man *carelessly* steps on a nail which has been *carelessly* left upright in a board *carelessly* deposited in a walkway, or a man *carelessly* left a pair of goggles hanging on a hook and *carelessly* continued his work in the presence of an eye hazard and later suffered the loss of vision in an accident caused by sheer *carelessness.*

The dictionary defines carelessness as "freedom from care, anxiety, or solicitude; *having no concern with consequences,*" etc. It would seem, therefore, that a surprisingly large proportion of our people can be charged with complete indifference to the possibility of, or immunity to, the results of pain, suffering, and financial loss!

Instead of *carelessness* on an accident report, would it not be more accurate to investigate and report the entire truth that the fault lay with questionable indoctrination of safety habits, superinduced by inadequate supervision and inattention to detail?

In other words, we may assume that one man may not have known that a skin puncture by an upturned nail can lead to blood poisoning and result in death; the goggle-on-the-hook individual may not have known that certain types of radiant energy or even the slight impact of a flying substance can cause permanent blindness. But by what right do we assume that the victim just did not *care* whether he lost an eye or developed blood poisoning?

We never will be convinced that any person above the mental age of a five-year-old doesn't *care* whether or not he falls victim of an injury. In fact, even infants manifest a very noticeable instinct for self-preservation; it is that instinct which is the side of the safety man, regardless of his title.

When sheer ignorance, excessive bravado, or sloppy safety practices rear their heads supervisors should accept the challenge rather than run for refuge by charging an accident to "carelessness"—unless, of course, that supervisor is willing to agree in writing that he and the working staff simply *do not care!—National Safety Council.*

THE HIGH COST OF FOREIGN OBJECT DAMAGE

YOU have all heard the expression that "paying alimony is like buying hay for a dead horse." The man who pays alimony doesn't receive anything in return for the money expended.

Foreign object damage to our aircraft falls into this same category. The time and money spent repairing foreign object damage does not add to our combat capability nor is it considered necessary for the training and experience of our mechanics. Another consideration, and one which may be the most important consideration to most of us, is the possible loss of life or injuries that can be traced to foreign object damage.

Getting back to the money and time loss, for which we have supporting statistics; here's what it has cost a Marine Aircraft Wing during one four-month period. Thirty-seven gas turbine engines were damaged by foreign objects.

It is not possible to show exactly how many hours were expended in repairing the damage or the money cost in new engines; however, it costs a squadron about 30 man-hours to replace one damaged engine. The cost for overhauling the 37 engines amounts to about $1,156,000.

From the safety of flight standpoint, metal objects and stones are considered highest on the priority list as they can cause engine failures in flight.

Well, what can we do about it? There are many things we can do about it and any one thing will not solve the problem. It is a continuous all hands project which must be pursued with initiative and tenacity.

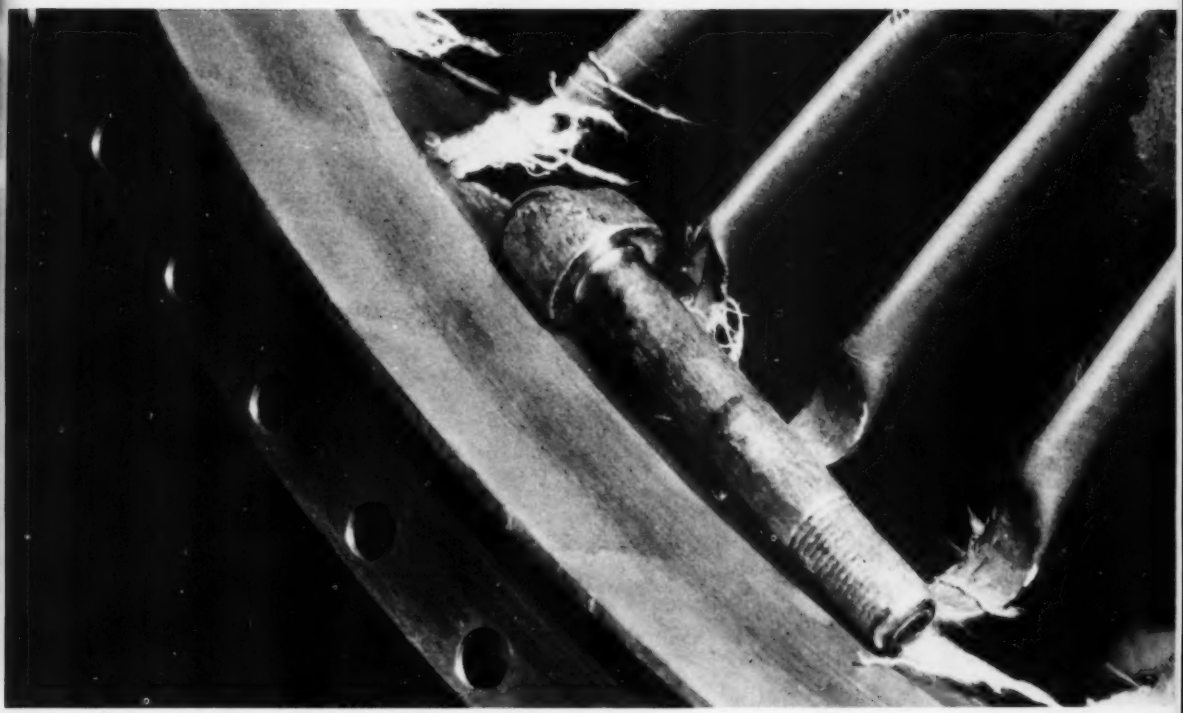
Here are some "Do Nots" that will help any prevention program:

1. Do not fail to properly account for each nut, bolt, washer, etc., used or replaced during any phase of aircraft or engine maintenance.

2. Do not fail to account for each tool used in the repair of an aircraft prior to starting or operating the engine.

3. Do not dismiss metal aircraft or engine bits and pieces found in the vicinity of an aircraft or engine without a positive identification and knowledge of their source and without properly disposing of the item.

4. Do not permit personnel to work around an aircraft or engine without a positive and reliable fastener on the identification badge (clips and buttons are not deemed satisfactory fasteners—a large and strong safety pin is considered more satisfactory).



FOREIGN OBJECT DAMAGE—Fragments of cotton rag and internal wrenching bolt lodged on leading edges of J57P4A fourth stage vane and shround assembly, above, found during disassembly caused extreme damage to 1st, 2nd and 3rd stage compressor assemblies, left. Source of bolt and rag entry is unknown. Recommendations — insure that aircraft ducts are free of loose material prior to engine run-up.

5. Do not overlook loose personal effects in the pockets of maintenance personnel as one of the causes of foreign object damage to aircraft gas turbine engines.

6. In all preventive procedures, do not fail to list transit carriers as a source of metal foreign objects.

7. Do not neglect mechanic's waste receptacles as part of standard foreign object damage prevention practices.

8. Do not neglect operational areas maintenance waste receptacles as part of standard foreign object damage preventive practices.

9. Do not neglect a "bend over" project in a local foreign object prevention campaign.

10. Do not neglect studying and compiling methods of preventing foreign objects from being blown, tracked, or washed into operational areas.

11. Do not fail to include certain routine ground maneuvering of aircraft as a direct cause of stone foreign object damage to gas turbine engines.

12. Do not schedule or operate a mechanical rotating sweeper without first adjusting the most effective sweeping speed of the sweeper.

13. Do not fail to insure that sweeping procedures incorporate an overlapping technique of sweeping.

14. Do not fail to pre-diagram sweeping instructions for each specific operational area, utilizing at least four different compass points of possible wind direction.

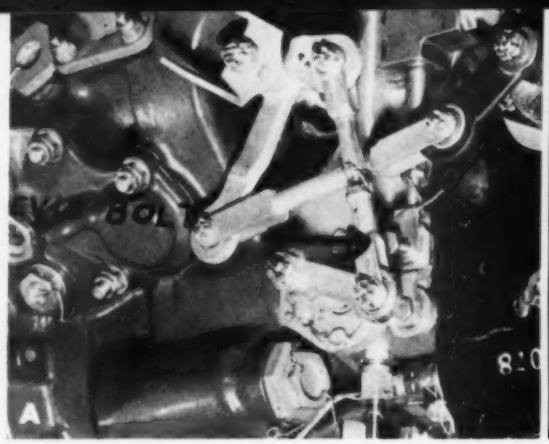
15. Do not rely on mechanical sweepers to do a complete job of cleaning operational areas.

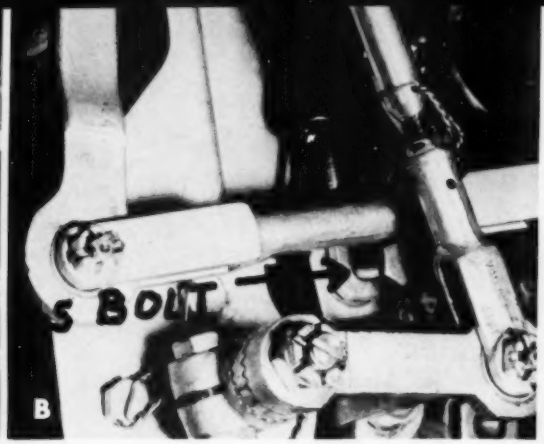
16. Do not neglect instituting procedures to refinish immediately with some type sealing compound, those small surface areas that are chipping or deteriorating as a result of the weather or service.

17. Do not rely upon one procedure or device (particularly run-up screens) to provide 100% foreign object damage protections.

18. Do not neglect to include an organized personnel foreign object pickup program in your local prevention project.

If you are stumped in trying to determine the duties of your "Foreign Object Damage Project Officer," see the Information Pamphlet on Aircraft Gas Turbine Engine Foreign Object Damage Protection published by the Naval Aviation Safety Center.—*(Adapted from 1st MAW "Wing Tips.")*



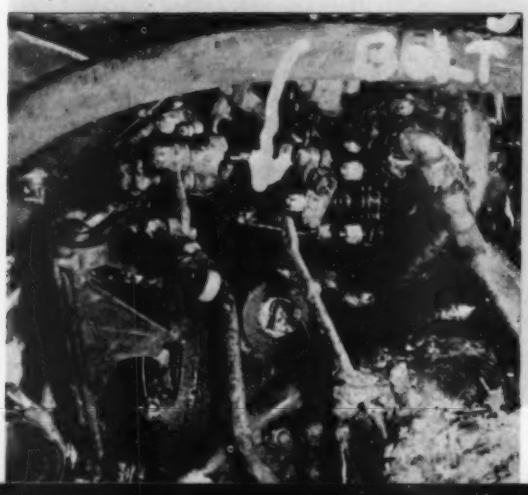


JAMMED THROTTLE LINKAGE

IN REPLACING the manually operated rotary shut-off valve of an F8U-1, the throttle linkage was disconnected to facilitate removal and installation of a new valve.

On first flight subsequent to this work the bolt connecting the pop-open nozzle piston shaft to the throttle linkage worked loose in flight due to improper securing. Power settings between 75% and MILITARY prevented the bolt from jamming the throttle because the yoke of the power control actuating rod was in close proximity with the head of the loose bolt. This allowed the bolt to slide freely against the yoke and kept the bolt in its proper position (photo A above). When the pilot entered the break, he retarded the throttle far enough to allow the bolt to slide out and rest against the rod part of the power control actuating rod. This limited throttle movement to a setting slightly above idle (64-69%) (photo B).

Fortunately, airspeed and altitude were in the pilot's favor and a normal landing was made. (For proper security of this linkage see J57 Engine Bulletin 320, Fig. 2.)



Use Correct Nut and Bolt in FJ Throttle Linkage

Several instances of throttle linkage disconnects due to the use of the wrong nut and bolt have been reported in FJ-3/3M/3D/4/4B aircraft. Reports indicate bolt AN4-12 (¼" dia. x 1¼" long, drilled*) is being used in place of correct bolt AN4-14A (¼" dia. x 1½" long, undrilled), ref. item 53 figure 204 of IPB NavAer 01-60JKD-504 revised 1 Jan 1959. The AN4-12 bolt has ⅛-inch shorter grip length than AN4-14A which does not leave sufficient threads for proper engagement of self-locking type nut.

Safety locking nuts AN363-428 are being reused instead of installing new AN365-428 nuts as required by the HMI. It is recommended that activities concerned insure compliance and early inspection to insure correct part use.

*** Bolts of ½-inch diameter and under which are drilled for cotter pin holes should not be used with self-locking nuts.**

—Ref. AN 1-1A-1 General Manual for Structural Repair.

NOTES AND COMMENTS ON MAINTENANCE

HOT BELT—The ejection seat was being removed from the F9F to facilitate cleaning the cockpit during an intermediate check. As the seat was removed the automatic lap belt release was triggered and fired, damaging release hardware.

Maintenance personnel commenced work on the aircraft prior to receiving the work order. The check crew failed to visually insure that the seat had been de-armed. The work order had not been issued because the ordnance crew had not signed off the work order for de-arming the seat. Published procedures were not followed for commencing work on an intermediate check. The check crew was being rushed to accomplish the job as rapidly as possible.

Maintenance personnel were rebriefed on the importance of following the published procedures. It was emphasized that quality of work is of prime consideration and cannot be sacrificed for speed or quantity.

CHOCK PLATES—The metal identification plates attached to wheel chocks are becoming detached. Detached plates, when picked up by jet or propeller blast, present a hazard to personnel. In addition, the plates are subject to induction into jet engine intakes due to their light weight characteristics.

The subject chocks should be screened periodically for loose identification plates. Plates should be resecured if practicable. Otherwise, the plates should be removed and pertinent information (contract number, contractor, etc.) be stamped or etched (burned) in a protected area on the chock.

(For more information on chocks please see "Headmouse," page 23.)

TAXI TRAP—After starting the R4D-8 the taxi director was in the process of removing the engine preheater from the vicinity of the aircraft when the plane captain (qualified to taxi) attempted to taxi the aircraft to the passenger loading area. The aircraft flight orderly who had been assisting the taxi director in starting the aircraft boarded the aircraft as the taxi director removed the preheater from the area of the aircraft. At this time the plane captain started to taxi the aircraft.

The NC-7 which had been used to start the aircraft was parked slightly to the right and forward of the starboard engine nacelle. The starboard prop struck the NC-7 then the starboard wing passed over the NC-7, tearing a section of the starboard flap. The NC-7 then came in contact with the starboard side of the fuselage causing minor skin damage. The starboard side of the horizontal stabilizer then struck the NC-7 with the tail wheel approximately 81 inches off the deck. Personnel ran out to the aircraft from the line shack and gave an emergency stop to the plane captain.

The aircraft sustained Charlie damage. To effect repairs the following was necessary: Change starboard prop, change starboard engine, change starboard flap, change horizontal stabilizer, and repair minor skin damage to starboard side of fuselage. Cost $38,520; man-hours 198.

The cause of this ground accident was the plane captain's attempt to taxi the aircraft without the assistance of a taxi director. No attempt was made to ensure that the area around the aircraft was clear prior to commencing taxi.

FUEL INTEGRITY CHECK—A TV-2 carrying a pilot and dual pilot flamed out at 11,000 feet, on an instrument climbout. The pilot immediately established a safe gliding speed and attempted several relights without any results. The fuel pressure indicator indicated ZERO throughout the attempted starts.

At approximately 8000 feet the occupants got a fleeting glimpse of the ground and determined that they were clear of populated areas, they made the decision to eject. First they jettisoned the tip tanks, then the canopy and the pilot told the dual pilot to eject. The dual pilot ejected successfully at approximately 7500 feet. The pilot attempted to eject, but could not. He then took both hands and pulled upon the starboard armrest and tried to fire the seat again, with no results. By this time the altitude was 3500 feet and the pilot resigned himself to crash landing the aircraft. He knew the overcast was approximately 800 feet, so he eased the nose over to pick up air speed and broke out between 700 and 800 feet with 240 knots. He saw two dirt roads and decided on one at his 8 o'clock position. He first made a left turn and then a right turn, lining up with the dirt road and dropped his gear and flaps. The landing was made in the middle of the road. Minor damage was sustained by the aircraft. The specific cause of the engine flameout was attributed to the main fuel line to the number 7 combustion chamber air adapter becoming disconnected which resulted in fuel pressure loss and fuel starvation to all combustion chambers.

Recommendations included:

► Fuel manifold and attached fuel lines should receive a fuel pressure check for leakage prior to installing the engine in the airframe.

► Proper torquing of fittings should be observed while reconnecting fuel fittings.

► Suitable means of lock-wiring fuel fittings be implemented for J33-A-20 engines which would be similar to that employed on the J48-P-8 engines.

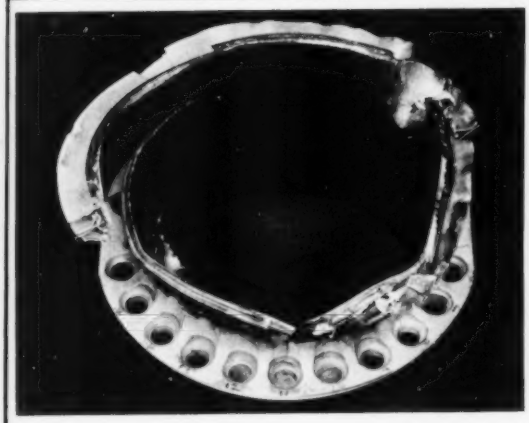
Cause of the pilot being unable to eject was determined by inspection and test; it appears that the complete procedure for ejection was not employed by the pilot.

The ejection seat "trigger" in this particular installation is actually a tubular handle of such similar material, design and color as to conceivably be confused with the arming handle. This "trigger" is being painted with fluorescent paint for quick identification, either day or night.

TRIM TROUBLE — Upon indications of excessive back yoke pressure required to raise the nose-wheel off the runway, the pilot of the S2F aborted his takeoff, dropped the tailhook and engaged the field arresting gear which brought the aircraft to a safe stop on the runway. The aircraft was being test flown following the installation of a new port elevator. The emergency field arresting gear prevented this aircraft from proceeding off the runway and into a lake.

Investigation revealed that the port elevator balance tab assembly, geared left-hand, (Part Number 89T-1006-S, Ref. AN 01-855AA-4 Figure 53, Index 9) had been rigged to match the starboard balance tab which remained as originally set. As a result, both tabs were rigged in the ⅜" "up tab" position which caused the nose-down condition. No previous nose down gripes were noted on this aircraft prior to installation of the new elevator. Rigging both balance tabs in the neutral position in accordance with the Handbook of Maintenance Instructions procedure corrected the condition as substantiated by a subsequent test flight.

Aircraft maintenance personnel are advised to follow the procedures as specified in the HMI on subsequent installation of this tab.



Be Careful With That Wrench

Analysis of this R3350-26WA cylinder failure disclosed that the nucleus of this fatigue crack was at a small indentation in the wrench relief area for the No. 11 position cylinder holddown capscrew. This indentation is believed to have been caused by the cylinder having been struck with the cylinder holddown capscrew wrench during cylinder installation. Extreme care must be exercised in the installation and tightening of cylinder holddown capscrew at the time of cylinder installation and/or replacement.

BLADE SECURING —An HTL-7 was being towed by tractor into hangar when the main rotor blade struck side of hangar. One main rotor blade buckled approximately 5 feet from tip (see photo). The main rotor head had to be replaced due to sudden impact.

The main rotor blade mooring block slipped off the main rotor blade permitting the blade to rotate while the aircraft was being towed.

The cause of this accident is directly attributed to the method in which the rotor blade securing strap was attached to the aircraft, which was in accordance with the HTL-7 Handbook of Maintenance Instructions.

Photo right shows a method of positioning the blade strap between the forward part of the ventral fin and the fuselage which will prevent the block from slipping aft and off of the rotor blade while ground handling the helicopter. To ensure security of the main rotor blade during ground handling the reporting command has adopted this method of securing the rotor blade mooring block strap.

HAZARDS OF ELECTRICAL SHOCK FROM JET ENGINE IGNITION SYSTEMS—Ignition systems for jet aircraft engines are of a type in which relatively low voltage and high current are capable of producing a fatal electrical shock. These systems include radioactive spark gap tubes. General Gas Turbine Engine Bulletin No. 53 of 30 August 1957 covers Scintilla Ignition Units that utilize radioactive spark gap tubes. It also illustrates four different styles of spark gap tubes currently used, and states handling precautions for same.

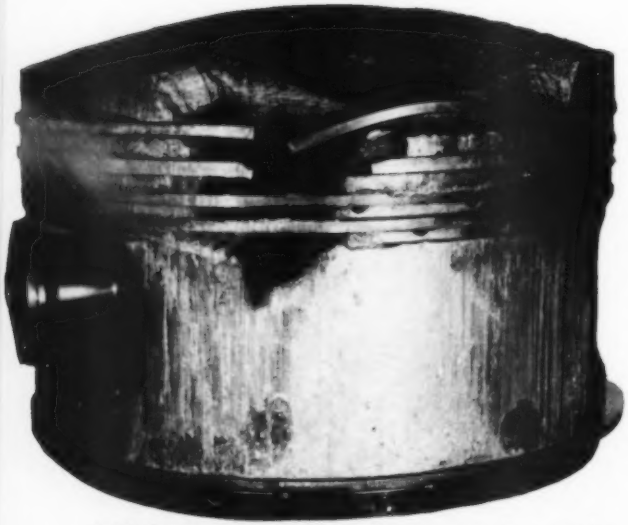
Certain models and modifications of Navy jet engines are equipped with these ignition systems. If you are uncertain as to the ignition system used on the model or modification that you are maintaining, then check the parts number of the ignition unit in the applicable engine IPC and refer to the publication or publications mentioned in the nomenclature column.

Normally only skilled personnel will work on the ignition systems, and these individuals should be thoroughly familiar with the hazards of electrical shock and what procedures to follow in case of electrical shock.

Preventive measures should be enforced in all cases—such as prohibiting the operation of the ignition system while any person is in direct contact with any portion of the coil, spark gap tube, ignitor leads . . .

Insure that the practice of testing for spark by disconnecting the ignition lead and drawing an arc from ground is not followed. This practice is not only unsafe, but will not provide an accurate indication of system performance.

It should be understood that there is no danger of electrical shock or radiation if proper handling procedures for these engines or ignition units are observed.



DETONATION—About 5 minutes after a go-around on a radar controlled approach, the AD-7's engine back-fired and began to run rough. Ground witnesses later reported a large puff of white smoke. The pilot made a forced landing at a nearby civil airport. Subsequent engine inspection revealed severe detonation damage (photo above). The landing was successful and no further damage occurred.

DAY-GLO GUST LOCKS—The A4D was towed from the hangar to the line for turnup. The power plants trouble shooter checked the tailpipe and intakes, but failed to see and remove an aileron gust lock prior to turnup. While the aircraft was being turned up, the flaps were actuated, resulting in damage to the left hand flap and aileron.

The aircraft had been in use by a special weapons loading crew; the gust lock was installed to prevent the flap from drooping and interfering with the weapons loading operation. All line personnel have been briefed on the necessity of conducting a thorough and complete preflight of an aircraft prior to any turnup and/or systems checkout. The numerous pennants on an aircraft, i.e., landing gear down locks, pitot cover, bungee lock . . . tend to reduce the warning effect of the pennant on the gust lock. Therefore, this command has modified the gust lock by the addition of a large (8" x 10") plate painted with Day-Glo orange. This plate extends upward, vertically, from the gust lock. In addition, a "Gust Lock installed" sign will be placed in the cockpit whenever the gust locks are installed.

Recommendations and Conclusions From Engine Disassembly and Inspection Reports

J57-P-8—Priority D.I.R. for cause of loss of engine oil during 2.4 hours of test concluded to have been caused by shearing of teflon seals Part Nos. 171385 and 171386 on reassembly of turbine shaft due to misalignment of seals on oil tube assembly Part No. 318293. This misalignment on assembly and subsequent pressure exerted on unit during the assembling process caused seals to be extruded, and complete failure occurred when extruded sections of seals became dislodged in service. The number 4½ bearing was found disintegrated, with evidence of overtemperature and race rotation.

Recommendation: Activities assure that:

(1) qualified personnel are assigned to engines assembly

(2) adequate equipment is available during reassembly to preclude possible engine damage

(3) check and test instructions are rigorously enforced.

J57-P-4—Disassembly of engine revealed the number 4½ bearing carrier Part No. 261284 was broken, and the carbon seals were broken. It was concluded the bearing carrier failure resulted from damage sustained during shaft installation.

Recommendation: Every precaution should be taken to prevent axial loading of the 4½ bearing carrier or rollers during installation of front compressor turbine drive shaft.

J57-P6B—Engine turned in for hot start, 1300° F. on one thermocouple. Inspection revealed 15 fuel nozzles clogged, resulting in bowed guide vanes from abnormal exhaust gas distribution.

DIR Comment: "Timely Thermocouple Temperature Spread Check Prevented Severe Engine Damage and a Possible in Flight Failure."

J57-P8—Engine removed for foreign object damage, also revealed a damaged compressor bleed valve assembly Part No. 302635.

This damage and mutilated bleed valve assembly was caused by removing snap-ring Part No. 211346 without first removing lockpins Part No. AN 150207 when replacing the screen assembly in the field.

MURPHY'S LAW*

* If an aircraft part can be installed incorrectly, someone will install it that way!

All the fuel quantity probes in an F8U-1 were removed for cleaning. After reinstallation of the probes and reassembly, the aircraft was fueled, turned up, topped off with fuel and flown one flight. As the aircraft was being refueled after the flight, the plane captain heard a loud hissing, cracking noise and secured the fueling nozzle.

Investigation revealed that one of the center line rivets in the upper skin of the wing fuel cell, at about fuselage station 365, had sheared and was relieving the pressure that had built up on the wing cell. The athwartships strength members of the forward portion of the wing fuel cell were buckled and cracked. The fore and aft rows of rivets on the upper skin on the wing fuel cell from about fuselage station 350 to 389 were stressed. The lower skin in this area had to be replaced. Estimated time of direct repair: 445 man hours.

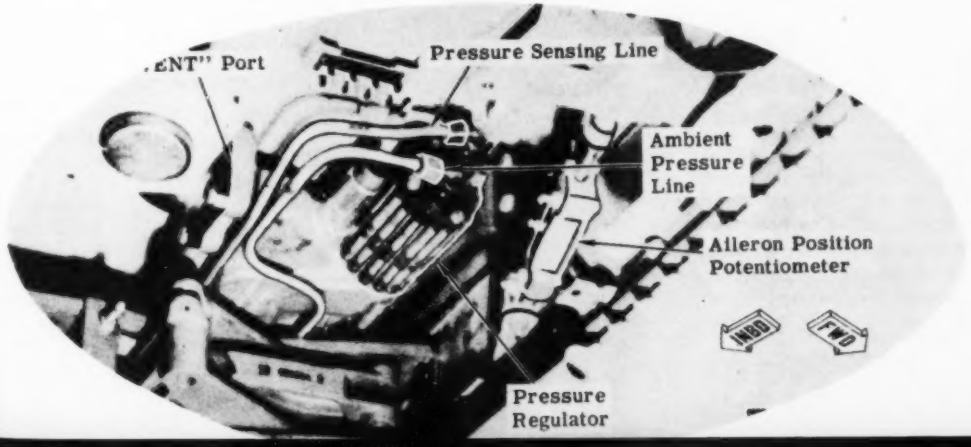
The occurrence was caused by the crossing, at the bulkhead fittings, of the pressure sensing line and the ambient pressure line. These pressure lines lead to the wing fuel cell pressure regulator. Paragraph 5-252B in Section Five of the F8U-1 HMI dated 15 January 1958 requires that a low pressure air source be connected to the ambient pressure line and that someone feel for the flow of air in the right-hand wheel well. This check for proper assembly of the ambient air line was not performed.

The accident did not occur during the first fueling operation because the two lines were not connected to the regulator. The investigation did not reveal when the damage occurred, i.e., during the turn up, upon topping off with fuel, in flight or during the last refueling operation.

The reporting custodian has reemphasized to all concerned the importance of following the step by step instructions set forth in the HMI. The continuity check mentioned above has been made a part of the procedures that are carried out whenever the pressure regulator is to be reconnected. A system has been initiated whereby a supervisor from each shop involved inspects any work performed prior to the final buttoning up of the access plates. This man will have a fresh outlook and may easily discover an error which the crew working on the job has missed over and over.

This accident is a perfect example of Murphy's Law in that two lines of the same size with identical fittings are connected in close proximity in a half blinded area. It is recommended that fittings of a different size be used on both ends of one of these two lines and the associated connections on the regulator and at the bulkhead. This would make it impossible to cross-connect the two lines.

A service change correcting this design deficiency was recommended to BuAer. ●



Clipboard

Altitudes & Midairs

► Midair collision reports are revealing an alarming unfamiliarity by pilots of the semicircular rules, according to the Federal Aviation Agency. As a result, the agency is urging all pilots to study regulations covering VFR flights above 3000 ft. Specifically, semicircular rules call for operation of VFR flights at odd thousands plus 500 ft. when on a magnetic course of zero degrees to 179 deg. and at even thousands plus 500 ft. when on courses of 180 deg. to 359 deg. below 29,000 ft. and above 3000 ft. —*Aviation Age*

Stations To Tell Pilots When Flying At Wrong Altitudes

AIR Traffic Communications Stations henceforth will have the authority to tell a pilot when he is flying VFR at a wrong altitude. Due to legal technicalities, they have been prohibited from so advising a pilot flying VFR when his position report indicated the wrong altitude for the direction of flight. A bulletin is going out to all ATCS's removing the bar.

The step follows close upon the heels of an FAA study of pilot statements submitted in connection with reports of near mid-air collisions. These, FAA stated, "revealed an alarming unfamiliarity by pilots of the semicircular rules (Part 60.32(a) of the Civil Air Regulations) adopted by CAB on Aug. 15, 1958." FAA is urging all pilots to restudy and familiarize themselves with these rules. FAA cautions that pilots not operating by the prescribed regulations are subject to penalties under the law.—*Aviation Daily*

Radar Advisories To Prevent Collisions

BECAUSE we haven't had a midair collision in the past few weeks, doesn't mean the danger has decreased. Use both arrival and departure radar for traffic advisories when VFR. Eighty percent of midair collisions happen in VFR weather with visibility fair to good.

—*ALPA Tech Talk*

Midair Prevention

AN ENTIRELY new and bold scheme of markings for BEA airliners has been devised to combine greater visual prominence both in the air and on the ground. To achieve this BEA has made a clear breakaway from traditional airliner styling.

In the new livery the entire wing surfaces, both top and bottom, are painted a bright red. The tail, too, is made to stand out vividly by reason of the large red BEA square on the white fin. The fuselage retains its white roof, useful for keeping the passenger cabin cool in warm climates, but it also carries a broad black stripe running from nose to tail the depth of the cabin windows.

The new airliner markings, which will first be seen on the *Comet* 4B and *Vanguard* aircraft in 1960, have been evolved to satisfy the requirements of a panel of experts including pilots and engineers.—*Shell Aviation News*

Answers to Quiz, page 30

1. No, only those with hard surface, 3000' or longer with permission for military aircraft. Others are listed in the Flight Planning Document.
2. b., alphabetically by facility name.
3. No, they are on selective distribution, meaning that you will get only those charts covering the areas that you are likely to operate in.
4. That there is an approved jet approach procedure for that field.
5. False. There is only enough detail to allow you to fly through the area. Arrival charts will soon show preferential routes for those areas for flight terminating there.
6. No, not at present, however they are being standardized. (There are four different symbols to denote LF radio ranges).

Search Frequency

CAREFUL reevaluation of this phase of operations indicates that renewed emphasis must be placed on the shift by OSC to the CNAVanTra Rescue frequency (270.6mc) at the earliest possible time. When shifting from Guard to a discreet frequency, there is no danger of losing communications with any key unit in the operation —inasmuch as the "T/R + REC" feature of our radios permits the OSC to switch back and reinstruct any straggler who has remained on Guard.—*Deputy SAR Note*

Scan Man

". . . The pilot in command of a naval/marine aircraft designed to accommodate two persons in the cockpit will be responsible for both seats being occupied at all times. On occasions when either the pilot or copilot are absent from their seats they will be relieved by another pilot or crewmember who will carry out the responsibilities expected of a lookout. It is once again emphasized that there is no substitute for constant visual alertness in the cockpit to prevent near-miss siutations and the possibility of midair collisions."—*OpNav 3710.24*

Collision Avoidance Reminders

What To Do . . .

- Search first 30 degrees to each side of flight path almost continuously, with occasional glances out to 90.
- Move eyes in short jumps with fixations between movements.
- Move head occasionally to see around blind spots.
- Scan area into which turn is contemplated before starting turn.
- Interrupt long turns briefly for re-scan of future flight path; look backward as well as forward.
- Make evasive maneuvers that must quickly increase angle of closure.
- Keep windshield and canopy spotless.

AND Not Do . . .

- Do *not* go VFR in marginal weather. (Don't trust others to stay IFR).
- Do *not* neglect blind areas.
- Do *not* look without seeing.
- Do *not* wait to see miss-distance (alter course immediately).
- Do *not* be misled by slant visibility. (Forward visibility may be much less).
- Do *not* change altitude on straight-line airpath in terminal areas (if you are on VFR).
- Do *not* enter terminal areas at excessive speed.

Flight Safety Foundation

See " . . . only the BuNo has changed."

U.S.S. LANGLEY

CARRIER PLANE CHECK OFF LIST

Date_____ Aircraft Type_____ No._____

Are trailing hook and attachments in operating condition?_____
Does trailing hook come back to battery against fuselage?_____
Are all fuselage wires taut?_____
Is underbody of fuselage clear of all fittings that might engage deck wires or deck fittings?_____
Is sufficient sand load in the plane?_____
Does stabilizer gear work freely through entire range?_____
Is smooth deck tail skid shoe of approved carrier type installed?_____
Is dolly ring installed on tail skid shoe?_____
Is tail skid in good condition?_____
Is tail skid shock absorber taut?_____
Are wheel brakes disconnected? (For training only)_____
Are tires FULLY inflated?_____
Is landing gear shock absorber system in good working condition?_____
Is plane provided with releasing ring on axle spreader or belly of fuselage?_____
Is plane provided with hoisting sling?_____
Does engine turn up 1800 RPM or more?_____
Do all cylinders fire evenly at 1000 RPM?_____
Does engine throttle down sufficiently?_____
Does throttle move smoothly?_____
Is compass compensated?_____
Is deviation chart posted in pilot's cockpit?_____
Is pilot of plane familiar with carrier's signals?_____
Is plane provided with a copy of all signals necessary for communication between carrier and plane?_____
Is plane equipped with parachutes?_____
Is plane equipped with life jacket, Very pistol, small flag and staff?_____
Have plane spares, such as landing gear struts, wheels, tail skid, skid shoe, etc., been put aboard?_____
Have plane crew reported aboard?_____

Note: This form is to be filled out with "Flight Inspection Form" and both turned in to Flight Office, Langley, thirty minutes prior to scheduled time of flight quarters.

FOR AMPHIBIAN SCOUTS ONLY

Is oleo gear inflated? (Wheel and tail)_____
Are wheels FULLY down?_____
Is wheel retracting system properly lubricated and in good operating condition?_____
Is pontoon structurally sound?_____
Are there any leaks or water in any compartments?_____
Have all drains and inspection plates been removed for inspection and properly replaced?_____
Are any rivet heads cracked or cut off?_____
Is plane equipped with air-raft, air bottle and pump, fresh water and flashlight?_____

_____
(Signature of Pilot)

USS Langley—8-12-29—1M